

A Population Health Framework:  
Assessing Its Applicability for Primary Care Physicians

Owen Brian Adams

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## Acronyms

ACD	Avoidable cancer deaths
ACO	Accountable Care Organization
ACS	Ambulatory care sensitive
AFMC	Association of Faculties of Medicine of Canada
AHRQ	Agency for Health Research and Quality
AHS	Alberta Health Services
AIM	Access Improvement Measures
AMA	Alberta Medical Association
BMA	British Medical Association
CFPC	College of Family Physicians of Canada
CIHI	Canadian Institute for Health Information
CMA	Canadian Medical Association
EFPO	Educating Future Physicians for Ontario
EMR	Electronic medical record
EBP	Evidence-based practice
FCC	Family Care Clinic
FHP	Family Health Program
FPT	Federal Provincial Territorial
FTE	Full-time Equivalent
GP	General Practice or Practitioner
HEA	Health Equity Audit
HMO	Health Maintenance Organization
HTF	Health Transition Fund
IHI	Institute for Healthcare Improvement
MCC	Medical Council of Canada
MHI	Member Health Index
NHS	National Health Service
OECD	Organization for Economic Cooperation and Development
OMERACT	Outcome Measures in Rheumatology
PHE	Periodic Health Exam
PBPH	Practice-based population health
PCN	Primary Care Network
PCSA	Primary Care Service Area
PCT	Primary Care Trust
PDI	Performance and Diligence Indicators
PHAC	Public Health Agency of Canada
PHCTF	Primary Health Care Transition Fund
PHEN	Public Health Educators' Network

PHM	Population health management
PHM	Patient's Medical Home
PROM	Patient Reported Outcome Measure
QOF	Quality and Outcomes Framework
RWJF	Robert Wood Johnson Foundation
SDOH	Social determinants of health
SES	Socio-economic status
TOP	Toward Optimized Practice
U.K.	United Kingdom
U.S.	United States
USPSTF	United States Preventative Services Task Force
WHO	World Health Organization

## Thesis Abstract:

### A population health framework:

#### Assessing its applicability for primary care physicians

Population health is concerned with analyzing the factors that determine the uneven distribution of health in a population and it also proposes interventions to narrow health inequalities. Kindig has proposed a population health management strategy that would engage the health and other sectors on population health improvement through a financial incentive linked to health outcomes. Proposed elements of a population health approach in health care at the patient encounter level include paying attention to health determinants for the patient and ensuring interprofessional collaboration; at the system level the approach includes developing and advocating for interventions that address health inequalities, such as delivering services to under-serviced areas and vulnerable populations. There has been virtually no research among frontline clinicians on the awareness and salience of a population health approach.

In order to address this gap an exploratory study was conducted among family physicians in Primary Care Networks (PCNs) in Alberta, Canada. PCNs include capitation funding that is used to purchase services such as nursing, pharmacy and dietetics.

The physicians were able to describe their patient populations in terms of a full range of social determinants and the health status inequalities they produce. They emphasized the importance of preventive screening and counseling in contributing to the health of their patients, and cited the key contributions of other team members to these activities, as well as the electronic medical record (EMR). They reported ambivalence toward the effectiveness of financial incentives for population health improvement, and while there was some collaboration with schools, inter-sectoral collaboration has yet to develop outside the health sector.

This thesis has demonstrated the potential for primary care physicians to adopt a population health approach. However, there is a considerable distance to go in introducing an incentive approach for outcome-based population health management, as envisioned by Kindig.

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## CHAPTER 1.

### INTRODUCTION

“Population health” is broadly concerned with the determinants of, and associated interventions in, the level (both quantity and quality) and distribution of health in a population.<sup>1</sup> As will be set out below population health has been evolving in concert with other developments in health policy and health systems research through several phases. Initially it was set out as a conceptual framework that identified a set of variables (e.g. environment, socio-economic status, lifestyle) and mapped out their relationship to health status in a framework. Subsequently it has guided the development of operational definitions that have been implemented in population-based surveys and systems of health indicators. A further phase has been the effort to define and apply the elements of a “population health approach”, among which the improvement of health equity has received a major focus. As these developments have been taking place there has been growing attention on health system performance with a focus on health care quality and health outcomes. The focus on quality and outcomes has given rise to an interest in linking provider remuneration to improvement efforts in these areas.

The goal of this thesis is to establish the potential and preparedness for primary care physicians to adopt a population health approach in their interactions with their patients, both individually and collectively. This will entail physicians looking beyond the individual patients they treat to the broader determinants, aggregate levels and distribution of health in their practice populations, and ultimately to the communities in which their practice populations are situated, including linkages to the education, social and other sectors in the community.

### ***How health care became marginalized as “population health” emerged***

While the current conceptual framework for population health is largely attributed to Evans and Stoddart’s 1990 germinal paper *Producing Health Consuming Health Care*<sup>2</sup> (circulated much more widely in 1994 in the collection *Why Are Some People Healthy and Others Not?*<sup>3</sup>), this was a rediscovery of social determinants of health. Indeed, German physician Rudolf Virchow made one of the earliest contributions to the study of the social determinants of health in an investigation of a typhus epidemic in Upper Silesia in 1848, from which he concluded that the spread of the illness was due to “the wretched conditions of life that poverty and lack of culture had created”.<sup>4(p91)</sup> In Canada, Marsh and colleagues conducted research among unemployed men in Montreal in the 1930s and documented the effects of poor nutrition and living conditions. They concluded their report with the question “how can medical care best be provided more systematically and equitably for the large section of the population who cannot pay for it on an individual basis and are not getting it sufficiently now?”<sup>5(p215)</sup> Marsh subsequently advocated for universal health insurance in Canada in 1943<sup>6</sup>, a call that was repeated in other proposals and studies until it was eventually implemented almost three decades later. Thus in the 1940s universal health care was envisioned as a key pathway to the improvement of population health. Perhaps as a result of the prosperity that followed World War II, the relationship between unemployment and health was not revisited with any concerted attention until the 1970s with the publication of M. Harvey Brenner’s landmark book, *Mental Illness and the Economy*, which linked increases in suicide and mental illness to downturns in the economy.<sup>7</sup>

As universal health insurance was realized in industrialized countries in the 1970s, health care services began to be marginalized as a determinant of population health. This occurred as a

result of several factors that expanded the conception of the determinants of health and widely popularized the concepts of health promotion and illness prevention. One factor was the recognition of lifestyle as a determinant of health, most notably in the 1964 U.S. Surgeon General's landmark report on smoking and health.<sup>8</sup> A second contributing factor was the work of McKeown and colleagues in which they studied the decline of mortality in Great Britain during the 18<sup>th</sup>, 19<sup>th</sup> and 20<sup>th</sup> centuries. In their first paper (1955) McKeown and Brown considered and discounted the impact of surgery, midwifery, medicine, hospitals and dispensaries and preventative therapy (smallpox inoculation), concluding that improvements in the environment were the most likely cause of the decline in mortality in the late 18<sup>th</sup> century.<sup>9</sup> In their 1962 assessment of the 19<sup>th</sup> century, McKeown and Record attributed the decline in mortality to the rising standard of living, public health measures, and what they termed a "favourable trend in the relationship between infectious agent and the human host."<sup>10(p121)</sup> In their 1975 assessment of the 20<sup>th</sup> century mortality declines, McKeown, Record and Turner suggested that the advance in nutrition was the major influence<sup>11</sup>. In 1980 McKeown offered an interesting distinction between the role of the individual physician versus the collective responsibility of the medical profession. He noted that "a physician who treats sick people cannot be expected to deal with national food policies, changes in the environment and public attempts to modify behavior...medicine as an institution should be concerned with such matters."<sup>12(p56)</sup> McKeown's work was replicated and made more popular by others. For example, McKinlay and McKinlay reported that "3.5 percent probably represents a reasonable upper-limit estimate of the total contribution of medical measures to the decline of mortality in the United States since 1900".<sup>13(p425)</sup> A third factor was the impact of Hans Selye's biological research on physiological changes in rats in response to noxious stimuli, which he generalized to humans,

noting that humans would respond differently to stress depending on endogenous (e.g., genetic, age) and exogenous (e.g., environment, social influence) factors, i.e., coping mechanisms.<sup>14</sup>

During the 1970s, the concept of social support was widely advanced in research largely attributed to the work of Cassel and Cobb which demonstrated the role of the social environment in moderating the effects of stress.<sup>15</sup>

Former federal health Minister Marc Lalonde is credited with starting the population health movement in Canada and internationally in 1974 when he launched a *New Perspective in the Health of Canadians*, which introduced the four-fold “health field” concept of the environment, biology, lifestyle and health care organization as key determinants of health. This was an elaboration of a paper published in 1973 by Hubert Laframboise, Director-General of long-range planning at Health and Welfare Canada.<sup>16</sup> Citing McKeown’s work, Lalonde noted that: “when the full impact of environment and lifestyle has been assessed...there can be no doubt that the traditional view of equating the level of health in Canada with the availability of physicians and hospitals is inadequate...future improvements in the level of health of Canadians lie mainly in improving the environment, moderating self-imposed risks and adding to our knowledge of human biology”.<sup>17(p18)</sup>

In 1978, the World Health Organization (WHO) Declaration of Alma-Ata set out a seven-point definition of primary health care. While health services was one of the seven points, including promotive, preventive, curative and rehabilitative services, the other points expanded the concept of primary health care considerably to implicate virtually all sectors of society and the economy, emphasizing the role of the multidisciplinary team.<sup>18</sup> Some felt that the focus of the Alma-Ata Declaration on health was to the detriment of the need for acute treatment. As

Passmore noted in 1979, “all of us at some time or another require professional care for an injury.”<sup>19(p1008)</sup>

The 1970s also saw the rise of a reactionary movement to the expansion of western medicine. In 1975 Ivan Illich published *Medical Nemesis* in which he described the “medicalization of life” as the over-dependence on medical services of questionable benefit and risk of harm.<sup>20</sup> In a 1982 lecture to the Royal College of General Practitioners he challenged GPs to “demedicalize”, cautioning that “the shift from curative to preventive medicine, while often justified, could also be used as a rationale for more intense medical policing.”<sup>21(p467)</sup> In addition, several feminist critiques of the medicalization of women’s health were published during this period. In 1973 Ehrenreich and English traced the origins of medicalization to the mid-1800s, beginning with the “cult of invalidism” in which women were assumed to be innately predisposed to illness. They suggested that a major driver of medicalization was the medical monopoly that resulted from the growing dominance of scientific medicine in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, particularly in the areas of childbirth and reproductive health (e.g. medical control over abortion and contraception).<sup>22</sup> A decade later Riessman documented the medicalization of premenstrual syndrome and weight control, and in 2005 Ehrenreich and English examined the recent evidence of the risk of long-term use of hormone replacement therapy (HRT), stating that “the HRT scandal ranks among the worst examples of medical experimentation on women we found in our research across two centuries of American medicine.”<sup>23,24(p350)</sup> In 1980 Relman warned about the rise of the “medical-industrial complex” and the tendency of the for-profit health sector to “emphasize procedures and technology to the exclusion of personal care.”<sup>25(p969)</sup>

Another significant contributor to the marginalization of health care services in the population health construct was the 1980 report of the Working Group on Inequalities in Health (UK), chaired by Sir Douglas Black. The Black report documented persistent inequalities in health status despite the introduction of the National Health Service (NHS) in 1948. Moreover, the Black report also documented socio-economic inequalities in utilization of the NHS, particularly in the case of preventive services, with those in lower socio-economic classes reporting lesser use. The Black report recommended a broad strategy focusing on child benefits, education and housing, and its recommendations implicating the NHS called for a reallocation of resources to community and home-based care.<sup>26</sup>

The 1970s and 80s also saw the distinction between “upstream” and “downstream” determinants of health. This contribution was due to McKinlay, initially in a presentation to the American Heart Association in 1974, but it became more popular after it was republished in 1979.<sup>27</sup> Although McKinlay was thinking mainly about the upstream industries (e.g. tobacco and food) that were contributing to downstream problems such as obesity, and indeed considered prevention to be mainly a downstream activity, nonetheless “upstream” was widely appropriated by the health promotion and illness prevention movement as distinct from acute treatment.<sup>28</sup>

In the 1980s the rise of the health promotion movement also contributed to the de-emphasis of the role of health care. The 1986 Ottawa Charter for Health Promotion called for a distributed responsibility for health promotion in health services among individuals, community groups, health professionals, health service institutions and governments. It noted that “the role of the health sector must move increasingly in a health promotion direction, beyond its responsibility for providing clinical and curative services”.<sup>29(p3)</sup> Indeed, Canadian Health and Welfare Minister Jake Epp’s 1986 *Achieving Health for All: A Framework for Health Promotion*

excluded hospital and medical services altogether, calling for strengthening community health services such as assessment, home care, respite care and counseling.<sup>30</sup> The Canadian Hospital Association was critical of this exclusion, noting that the document did not recognize the role that health professionals in hospitals were already playing in health promotion and supported this with survey statistics showing that 74% of hospitals were either engaged in health promotion or looking into it.<sup>31</sup> In its response to the Epp report, the Canadian Medical Association (CMA) described in detail the physician's role in health promotion on a daily basis.<sup>32</sup> However, it has been recognized that there is a tension or competition between prevention and treatment activities in conventional medical practice. One study that observed the behaviour of physicians with respect to a list of activities from the United States (U.S.) Preventive Services Task Force (USPSTF) found that they spent just 11% of their time on prevention.<sup>33</sup> A more recent study has estimated that in order to fully address the USPSTF recommendations for providing preventive services to the typical practice population, 7.4 hours of each of a physician's working day would be required.<sup>34</sup>

Whereas health care organization was acknowledged as one of four key components of Lalonde's health field concept it was further reduced to one out of nine in the 1990 Evans and Stoddart population health framework that was developed under the auspices of the Population Health program of the Canadian Institute for Advanced Research in 1989. Evans and Stoddart were critical of what they believed to be the overexpansion of the health care system, suggesting that "health care uses up economic resources that could be used for other valued purposes. Canadians spend about 9 percent of their national income on health care, and these resources are thus unavailable for producing consumer goods like clothing or furniture, building rapid transit systems, improving the educational system, etc..."<sup>2(p1360)</sup> The subsequent uptake of population

health concepts by governments was rapid, probably even more so than the uptake of health promotion among provincial governments in the 1980s. One might speculate that a contributing factor was the severe recession of the early 1990s that put great pressure on provincial government budgets and would have made any proposal promising to reduce the demand for acute health services attractive. Indeed, public per-capita health expenditures in Canada declined from 1993 through 1996.<sup>35</sup> In 1991 the Healthy Public Policy Committee of the Ontario Premier's Council on Health Strategy produced a discussion paper on the determinants of health that drew heavily on the Evans and Stoddart framework. The paper emphasized the limitations of the traditional health care system, suggesting that "practicing doctors frequently express frustration about how they are usually able to treat only the symptoms, not the causes, of ill health".<sup>36(p6)</sup> The Committee highlighted the influences of work hierarchy and unemployment and it identified three broad areas for policy development, including healthy child development, adult and labour market adjustment and the natural and built environment.

In 1992 Quebec Health Minister Marc-Yvan Côté issued a policy document on health and well-being that set out nine objectives "intended to reduce the most widespread health and social problems affecting the public".<sup>37(p10)</sup> The strategies put forward to achieve the objectives embodied elements of the population health framework:

- Reinforcing the individual's potential (personal habits and behaviour);
- Providing support in social settings (social and physical environment);
- Improving living conditions (income, education, housing, employment); and
- Coordinated public policy (across Ministries).<sup>37</sup>

Also in 1992 Saskatchewan health Minister Louise Simard introduced a "wellness" approach to health that specified that health determinants included "employment, income,

education, housing, the environment and individual lifestyle choices.”<sup>38(p10)</sup> At the same time the government announced the closure of 52 small rural hospitals. James has suggested that decision could be linked to the adoption of the population health framework, or that the framework could be used to rationalize a decision otherwise made for budgetary reasons.<sup>39</sup>

In its policy platform for the 1993 federal election the Liberal Party of Canada included the schematic diagram of the Evans and Stoddart framework, with the observation that “every study shows that the treatment of sick people is the least important factor in the overall health of society.”<sup>40(p78)</sup> *Strategies for Population Health*, a report prepared by the Federal, Provincial and Territorial (FPT) Advisory Committee on Population Health was presented to Canada’s health Ministers at their annual meeting in September, 1994. This report made it clear for Canada’s FPT governments that health care was not part of population health with the statement that “these services are not really part of a population health approach, because they focus essentially on individual disease and clinical risk factors.”<sup>41(p25)</sup>

Reflecting the evolution of these reports, at the present time the Public Health Agency of Canada (PHAC) lists 12 key determinants of health:

- Income and social status;
- Social support networks;
- Education and literacy;
- Employment/working conditions;
- Social environments;
- Physical environment;
- Personal health practices and coping skills;
- Healthy child development;
- Biology and genetic elements;
- Health services;
- Gender; and
- Culture.<sup>42</sup>

With regard to incorporating social determinants of health into formal policies however, the uptake of Canada's pioneering thinking in the work of Lalonde and Epp has spread internationally to a much greater degree than within Canada itself.<sup>43,44</sup> The Nordic countries are a good case in point. In 2002 the Swedish government put forward a comprehensive public health legislation that set out 11 domains of objectives that cover the full range of health determinants.<sup>45</sup> Similarly the Finnish government has evolved from a policy program for health promotion to a national action plan to reduce health inequalities<sup>46</sup> and in 2006 Norway adopted a national strategy to reduce social inequalities in health.<sup>47</sup>

### ***Elements of a population health approach***

Since the 1990s a variety of definitions have been put forward for what constitutes a "population health approach". Most of them originate in Canada and in particular from regional health authorities that were designed with a view to being cross-sectoral. In 1994 the Federal, Provincial and Territorial Advisory Committee on Population Health identified five interrelated areas of policy and intervention that would constitute a comprehensive population health strategy: social and economic environment, physical environment, personal health practices, individual capacity and coping skills, and health services.<sup>41</sup> A 1999 population health promotion framework for the Saskatchewan Regional Health Authorities that acknowledged a debt to Lalonde and Epp identified five areas, including: building healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services (community partnerships).<sup>48</sup>

In 2001 Health Canada developed a population health template that set out eight elements, with the suggestion that the first two were unique to a population health approach:

- "Focus on the health of populations; and

- Address the determinants of health and their interactions.<sup>49(p7)</sup>

The other elements include a focus on upstream investment, collaboration across sectors and measuring and reporting on health outcomes.

Building on the population health template, PHAC has identified several implementation strategies for a population health approach, including: health promotion, disease (and injury) prevention, risk management, policy coordination, medical treatment, rehabilitation, and palliative care.<sup>50</sup> These strategies reflect the four basic elements of primary health care set out in the Alma Ata Declaration, as well as expanding them to include palliative care and Epp's concept of policy coordination across sectors.

In 2005 the Edmonton Social Planning Council set out a social determinants of health (SDOH) framework for Alberta that emphasized the political and policy environment. The elements included: foster political will by promoting understanding of SDOH among decision-makers, increase awareness among Albertans about SDOH, collaborate across sectors and jurisdictions, adopt healthy public policies that address health and equity, and develop surveillance systems to support addressing SDOH.<sup>51</sup>

The most common elements among these various strategies are that we should: promote an understanding of social determinants of health and their relationship to health inequalities; focus on “upstream” activities of health promotion and disease prevention; and collaborate across different areas of the health sector and between health and other sectors. The above review of the emerging population health discourse indicates that primary care, though present in a long list of other strategies and sectoral issues, is no longer seen as central within health systems. This may be indicative of a disconnect between front-line health care practitioners and the evolving discourse of population health, a disconnect that will be explored in this thesis.

### ***Evidence that primary care influences population health***

While the evolving conceptual framework for population health has tended to diminish the role of health care, there is evidence, although it is not unequivocal, from an aggregate (ecological) level that health care does make a positive contribution to health status, particularly in the case of primary medical care. At this point it should be noted that there is a range of definitions of primary care.

In its 1994 definition, the CMA put forward a medical and clinical orientation: “primary medical care consists of first-contact assessment of a patient and the provision of continuing care for a wide range of health concerns. The scope of primary medical care includes the diagnosis, treatment and management of health problems; prevention and health promotion; and ongoing support, with family and community intervention where needed.”<sup>52(p2)</sup>

As noted previously the 1978 Declaration of Alma Ata adopted a definition of primary health care with a broader societal orientation:

Primary health care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford. It forms an integral part both of the country’s health system of which it is the nucleus and of the overall social and economic development of the community.<sup>18(pp1,2)</sup>

Health Canada’s definition (undated) situates primary medical care within the broader definition of primary health care: “primary health care refers to an approach to health and a spectrum of services beyond the traditional health care system. It includes all services that play a part in health, such as income, housing, education, and environment. Primary care is the element within primary health care that focuses on health care services, including health promotion, illness and injury prevention, and the diagnosis and treatment of illness and injury.”<sup>53(p1)</sup>

In 2006 a multidisciplinary collaboration among national Canadian medical and health organizations adopted a definition of a population health approach in primary care: “a population health approach is a consistent and rational way to set priorities, establish strategies and make investments in action to improve the health of the population... services are provided in a holistic fashion across the continuum of care, including health promotion and prevention, treatment, referral, therapy, supportive care and palliation.”<sup>54(pp3,4)</sup>

Since the mid-1990s there has been a great deal of attention in Canada on “primary care reform”. This was initially galvanized by a 1995 report for the FPT Advisory Committee on Health Services that called for the rostering of the population in Primary Care Organizations that would be funded on a capitated basis and with an associated rapid phase-out of fee-for-service remuneration.<sup>55</sup> While the funding of primary care is an ongoing issue in Canada there has been even greater emphasis on the development of new delivery models that encompass a range of providers. A key impetus for the implementation of new models was the \$150 million Health Transition Fund (HTF) that was announced in the 1997 federal budget on the recommendation of the National Forum on Health. The HTF was intended to support pilot projects in four areas including primary care (defined as medical care) and primary health care (defined as a range of providers working in teams).<sup>56</sup> A synthesis of the experience of the 65 HTF projects in the primary health care area reported that these projects had exemplified a population health approach using strategies including multidisciplinary approaches, a focus on the sources of health problems and empowerment of communities through linkages with other sectors.<sup>57</sup>

Primary care featured prominently in the 2000 First Ministers’ Health Accord, with the commitment to “promote the establishment of interdisciplinary primary health care teams that provide Canadians first contact with the health care system.”<sup>58(p2)</sup> This commitment was backed

by the \$800 million Primary Health Care Transition Fund (PHCTF) that was intended to advance beyond pilot projects “to ensure that long-term sustainable change is achieved over the fund’s lifespan”.<sup>59(p1)</sup> In their 2003 Health Accord, First Ministers went a step further by agreeing to the goal of “ensuring that at least 50% of their residents have access to an appropriate health care provider 24 hours a day, 7 days a week” and they set a target date of 2011 to achieve it.<sup>60(p3)</sup> The PHCTF has had mixed results in achieving transitional change. Hutchison et al. reported in 2011 that Alberta, Quebec and Ontario had made substantial progress toward the First Ministers’ 50% target. One shortcoming of long-established primary care models that they identified was in the area of governance, with the observation that providers and stakeholders “have no collective voice and no means for assuming collective responsibility and being health accountable for addressing their patients; and the local population’s needs”.<sup>61(p270)</sup> Based on a 2012 environmental scan, the Conference Board of Canada has reported that all provinces and territories are undertaking initiatives to improve collaborative team-based care.<sup>62</sup> In reviewing these initiatives the Conference Board has also identified several barriers that need to be addressed, including a lack of “strong governance structures”, insufficient education and training for interprofessional delivery models and funding models that do not adequately address the incorporation of non-physician team members.<sup>63</sup>

Thus one end of the spectrum of primary care definitions comprises clinical activities provided mainly by physicians, while at the other end Health Canada defines it broadly beyond the traditional health care system. While considerable evolution in primary care conceptualization has been taking place in Canada since 2000, the funding, organization and delivery of primary care, and hence the empirical research, have been previously heavily oriented towards primary medical care (henceforth referred to as primary care for brevity), and

that will be the setting for this research project. Several studies based on ecological data have reported findings of a positive contribution of primary care to health outcomes. In one of the first quantitative contributions, based on a multivariate analysis of mortality in 21 member countries of the Organization for Economic Cooperation and Development (OECD) over the 1960-95 period that included other variables such as Gross Domestic Product per capita and alcohol consumption, Or reported that physician supply (total general practitioners and specialists) was significantly associated with lower mortality, stating that, “a 10 percent increase in the number of doctors, holding all other factors (variables) constant, would lead to almost a 6 percent reduction in premature mortality by heart diseases in men and 6-1/2 percent for women”.<sup>64(p25)</sup> In a subsequent multi-level analysis of the 21 countries over the 1970-1978 period in which they examined several indicators including life expectancy, premature mortality and infant mortality, Or et al. confirmed the earlier finding that physician numbers are an important determinant of mortality across OECD countries. Moreover, among the 21 countries they found that Japan and Canada were the best performers in terms of what they described as the technical efficiency of health improvement related to physician supply. They did not offer a specific explanation of Japan and Canada’s relative performance but suggested that this could be due to technical efficiency associated with fee-for-service payment.<sup>65</sup> Arah et al. conducted a pooled time-series analysis among 18 OECD over the 1970-1999 period. Using a similar list of control variables to Or, plus additional ones including fat consumption and immunization they found that in the case of all-cause mortality, physician supply was not a significant predictor of lower mortality, although physician visits were. Both were significant predictors of lower premature mortality.<sup>66</sup> At a sub-national level, Gulliford examined the relationship between the supply of general practitioners (GPs) and mortality for 99 health authorities in England in 1999. He found a

significant negative relationship between the standardized mortality ratio and increases in physician supply after adjusting for deprivation score, ethnic group and social class.<sup>67</sup> However, in a subsequent analysis, when Gulliford et al. added the proportion of rural patients and patients aged 75+ as predictor variables, the physician supply remained only statistically inversely related to acute hospital admissions.<sup>68</sup> Based on an extensive systematic review, Starfield et al. have reported that primary care not only helps prevent illness and death, but also promotes a more equitable distribution of health in populations. Starfield and colleagues put forward several reasons as to why this might be the case, including that primary care increases access to health services for deprived groups, and primary care's impact on prevention and on the early management of health problems.<sup>69</sup> More specifically, based on a pooled analysis of 10 studies in the United States over the 1980-1985 period, they have estimated that an increase of one primary care physician per 10,000 population is associated with an average mortality reduction of 5.3 percent.<sup>70</sup> Macinko et al. also conducted a pooled time series analysis of 18 OECD countries over the 1970-1988 period for which they constructed a 10 item composite primary care score for each country for each year of observation. Controlling for several variables such as income and lifestyle, they found that the primary care score was related to lower mortality and premature mortality (Potential Years of Life Lost) although physicians per 1,000 population had a larger effect.<sup>71</sup>

One of the most methodologically rigorous studies to date has been carried out by Chang et al., based on the hospitalization and mortality patterns of U.S. Medicare patients that were examined across 6,542 Primary Care Service Areas (PCSAs). The PCSAs were divided into quintiles on two measures of the primary care physician work force. The first measure was a head count measure of primary care physicians per population. The second measure was an

estimate of full-time equivalent (FTE) primary care physicians derived from Medicare fee-for-service billings for primary care physicians. After adjusting for a number of variables, they found only small associations with the measure of primary care physicians per population but with the FTE measure they found that Medicare beneficiaries in the highest quintile of the primary care FTEs per population had 5% lower mortality, and 9% fewer hospitalizations for ambulatory care sensitive conditions.<sup>72</sup>

Some of the more recently developed indicators include ambulatory care sensitive (ACS) hospitalizations (hospitalizations for conditions such as angina, asthma and diabetes that should have been prevented if primary care was available) and amenable mortality (premature mortality that should have been prevented if timely and effective health care was available (e.g. selected childhood infections, treatable cancers)). Very few publications have been located that examine the relationship between these variables and primary care. In a study of hospital discharges of New York residents in 1995, Basu et al. reported a key finding of an inverse association between the supply of primary care physicians and the likelihood of an ACS hospitalization.<sup>73</sup> Macinko et al. conducted a pooled cross-sectional study of 558 Brazilian micro regions in which they examined ACS hospitalization rates in relation to the percentage of the population with access to a Family Health Program (FHP), a multidisciplinary primary care team. Controlling for factors including income and public health measures they found that access to a FHP was strategy associated with lower likelihood of ACS hospitalization.<sup>74</sup> Amenable mortality is a more recently developed indicator. Watson and McGrail have published simple scatter plots of physician supply against amenable mortality for 19 OECD countries for 2002 and concluded that there is no relationship.<sup>75</sup> Sundmacher and Busse have examined physician supply in relation to avoidable cancer deaths (ACD) across 439 districts in Germany over the

2000-2004 period. They found that an increase in physicians per 100,000 population was significantly associated with lower ACD rates for several cancers, and suggested that this could be due to better access or quality of Care.<sup>76</sup>

While the research evidence is far from definitive, it is noteworthy that the U.S. Healthy People Initiative, now in its fourth decade and looking ahead to 2020 has included “persons with a usual primary care provider” as one of 26 leading health indicators that have been selected from among the more than 1,200 measures that it is tracking for its almost 600 objectives.<sup>77</sup>

Notably, and by way of summary to this section, there have been challenges to the McKinlays’ estimate of the 3.5% contribution of health care to population health improvement, based on the experience of the latter decades of the 20<sup>th</sup> Century.<sup>78</sup> Bunker, for example, estimated that medical care accounted for 42% of the 7-year life expectancy gain in the United States between 1950 and the early 1990s.<sup>79</sup> The model developed by the University of Wisconsin Population Health Institute to rank the health of Wisconsin’s counties uses 20% as the contribution of clinical care to health status.<sup>80</sup> In its 2009 final report the Canadian Senate Subcommittee on Population Health estimated that socio-economic determinants account for 50% of health status, followed by the health care system at 25%, biology and genetics (15%) and the physical environment (10%).<sup>81</sup> While these figures are estimates, there appears to be a consensus that, in more recent decades, medical care has played a greater role in improving health than it did earlier in the 20<sup>th</sup> century.

### ***Population health interventions***

A challenge to the application of a population health approach to health improvement is the identification of where and how to intervene with effective tools and practices. Over the past few decades, considerable effort has been spent on trying to identify evidence-based

interventions in health care that will improve health status. In Canada these have included the work of the Task Force on Preventive Health Care<sup>82</sup> and the Canadian Agency for Drugs and Technologies in Health.<sup>83</sup> With regard to the distribution of health, this has received more attention in the United Kingdom, no doubt due to the lasting influence of the Black Report. One tool that has been developed in the United Kingdom during the past several years is the concept of Health Equity Audit (HEA), which was mandated for use in Primary Care Trusts (PCTs)<sup>i</sup> beginning in 2004.<sup>84</sup> The objective of HEA is to identify how fairly services or other resources are distributed in relation to the health needs of different groups and areas and to indicate priorities to provide services related to need. HEA consists of a self-assessment tool to be completed by the PCTs that uses a six-step loop that begins with priority-identification and ends with reviewing progress and assessing impact. The HEA tool is not directive in terms of enumerating what the priorities might be. A series of questions are identified for each step and there is an emphasis on the use of evidence. A baseline survey of PCTs conducted in 2004 found that the most frequent topics cited (out of a total of 277 discrete topics mentioned) were coronary heart disease, smoking cessation and access issues and that geographical inequities were much more likely to be identified than were those for social class or ethnicity.<sup>85</sup> In Canada a multidisciplinary group of clinicians in Toronto called Health Providers Against Poverty has developed a clinical tool for intervening with poverty in primary care. It involves a three-step process:

- Screening with the question “do you ever have difficulty making ends meet at the end of the month?”;
- Factoring poverty into clinical decision-making like other risk factors; and

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<sup>i</sup> There are some 150 Primary Care Trusts in England that are responsible for purchasing health services and managing primary care on behalf of their catchment populations. PCTs control 80% of the National Health Service budget. PCTs will have relationships with each General Practice in their area.

- Intervening by asking targeted questions as to whether different groups are receiving income benefits for which they are eligible.<sup>86</sup>

They have also developed a brochure for patients that explains what income support benefits are available and how to access them.<sup>87</sup>

Aside from the few published reports on HEA, the application of “population health” to address the social determinants of health in clinical practice has not advanced very far to date. In New Zealand Neuwelt et al. have proposed that a “population health approach to primary care delivers both high quality care and places an emphasis on equity, community participation and social determinants of health”, and have put forward several ideas on what a population health approach could mean for the daily work of GPs and primary care nurses. These include:

- “Caring for the population as a “client” with a focus on equity, community participation and social determinants;
- Commitment to the involvement of communities (particularly disadvantaged areas) in developing strategies to promote health; and
- Incorporating a concern for the determinants of health.<sup>88(p102)</sup>

In the United States Zenzano et al. have examined the roles of a variety of health professionals in clinical prevention and population health. For physicians they note the role of primary care physicians in disease prevention and health promotion and their public health roles (e.g., treating influenza outbreaks).<sup>89</sup> In the United Kingdom the Royal College of Physicians adopted a policy statement in 2010 that sets out 18 recommendations on the role of the physician in addressing social determinants of health in day-to-day practice, at a systems level and in medical education. Examples of the recommendations include:

- “All doctors should consider the impact on health inequalities of their day-to-day practice;
- There should be adequate medical input into decisions taken within non-health sectors to ensure that the initiatives do not exacerbate health inequalities and simultaneously maximize potential health gains; and
- Learning on health promotion, health inequalities, disease prevention and the social determinants of health should be made more engaging, be embedded as a vertical strand throughout medical education and be considered a key outcome of the process.”<sup>90(pp5,7,10)</sup>

Following the tenure of Sir Michael Marmot as President of the British Medical Association (BMA) in 2010-2011 the BMA set out a framework to guide what doctors can do to address social determinants of health. The framework consists of a grid that considers the level of action on one axis, ranging from local to international, and the type of activity on the other, including treating patients, community leadership, advocacy and research.<sup>91</sup> These developments in England are all very recent.

In Canada, Neudorf has recently proposed that regional health authorities can integrate a population health approach into health service delivery at three levels of activity:

- Direct delivery of population-based prevention and health promotion services through public health public health and primary care providers;
- At the health system level by developing health and analytical capacity, performing health care equity audits and health equity impact assessments; and
- At the inter-sectoral level through advocacy and collaboration.<sup>92</sup>

### *The evolution of an outcome focus in health care*

As the ability to identify and measure the determinants of population health and population health status has grown over the past few decades the interest in assessing the performance of the health system in producing health outcomes has increased as well. An important stimulus for work in this area was the 1993 World Bank report *Investing in Health*. This report presented estimates of the global burden of disease as measured through the concept of Disability-Adjusted Life Years, which was developed jointly with the WHO.<sup>93</sup> The WHO took this concept further by developing a framework for health system performance in its 2000 *World Health Report*. The framework examined Disability Adjusted Life Expectancy in relation to system responsiveness and fairness of financial contribution. Overall Canada ranked 35<sup>th</sup> out of 192 countries on its level of health and 30<sup>th</sup> in terms of the overall level of health achieved considering the level of expenditure.<sup>94</sup> The findings were widely criticized for a variety of technical issues and the WHO has never repeated it, but nonetheless it has since stimulated great interest in assessing value-for-money in the output of health care systems.<sup>95,96</sup> However, interest in health outcomes below the system level has lagged behind,

Health care services have been open to criticism over the years on account of the long delay in adopting a focus on positive health outcomes for patients and populations. Florence Nightingale is acknowledged as the originator of the systematic measurement of health outcomes following her experience in the Crimean War in the 1850s.<sup>97</sup> Almost 100 years ago Boston surgeon Ernest Codman proposed an “end result” system for which each patient was to have a card on which would be recorded the symptoms, diagnosis, treatment plan, complications, discharge diagnosis and “the result each year afterward.” He further proposed that results could be linked in some fashion to the surgeon’s remuneration; i.e. payment for outcome. These

efforts were resisted by his colleagues,<sup>98</sup> although in subsequent years discharge abstracts were developed widely and linked to accreditation activity. In 1966 Donabedian set out the “structure, process and outcomes” approach to assessing quality of care, although for many years since, the focus has been on assessing structure and process.<sup>99</sup> In the 1980s the health sector became interested in the quality management techniques that Deming had pioneered in the automotive industry and in 1989 the Canadian Council on Health Facilities Accreditation (since renamed Accreditation Canada) commissioned the first large outcomes monitoring project in Canada, with 26 hospitals participating across the country.<sup>100</sup> The focus of this study was on intermediate outcomes among hospital patients (e.g. unscheduled return to the operating room, nosocomial infection) that could be identified through chart abstraction, but it was not feasible to obtain measures of functional status before or after treatment. Beginning in 1999 the Ontario Hospital Association initiated a Hospital Report Card project. This included outcomes such as readmission and complication rates and also measured patient satisfaction based on surveys of discharged patients.<sup>101</sup>

From roughly the 1960s onward there has been growing interest in the social indicators movement about population-based measures of health status that can be collected on household surveys such as the National Health Interview Survey in the United States that was launched in 1957. In 1978 Canada implemented the Canada Health Survey that was based on Lalonde’s health field model. It included self-reported health measures such as activity limitation and chronic conditions.<sup>102</sup> Groups such as the RAND Corporation in the US developed multi-item indices such as the Short-Form 36, which was used in the large 1986-1992 Medical Outcomes Study.<sup>103</sup> At McMaster University in Canada George Torrance and colleagues developed the Health Utilities Index beginning in the 1970s.<sup>104</sup> Indices such as these have been extensively

used in clinical studies (e.g. pharmaceutical cost-effectiveness research) and in general population studies. Considerable research has gone into developing weights that can be used for the calculation of quality-adjusted life-years. The 1980s saw the first composite indicators of health status produced for Canada by combining life expectancy data with short- and long-term disability rates from household data<sup>105</sup> and an international network was established to promote such indicators in 1989.<sup>106</sup>

The health care sector in general has been slow to consider the ultimate outcomes of its activities in improvements in population health status, or to consider, as Codman proposed in the early 1900s, that remuneration might be linked to outcomes. Provider remuneration for hospital and medical services has historically been based on volume of activity. This approach was criticized during the rise of the health promotion movement when it was perceived in some quarters that fee-for-service payment rewarded procedures and treatments better than prevention and promotion activities. Based on their review of several studies, Rachlis and Kushner reported in 1989 that “under fee-for-service, immunization, well-baby care, annual cancer detection visits for women, and the like, typically pay much less on a money-per-time basis than other fee-for-service procedures.”<sup>107(p136)</sup> One solution that has commonly been advocated to redress this bias is the introduction of capitation (population-based) funding, whereby providers receive fixed remuneration to provide a range of services for a defined population over a specified period of time, and which is hypothesized to provide an incentive to keep the population healthy. This has become extensively adopted in the United States in the managed care industry where employers purchase insurance and health care from vertically integrated delivery organizations such as Health Maintenance Organizations (HMOs) that cover the full spectrum of primary to tertiary care. As of 2010 it was estimated that some 135 million Americans belonged to a managed care

plan, representing 44% of the total population.<sup>108</sup> Such an approach has not been implemented in Canada in an integrated fashion. Since Medicare began in the 1960s, the major components of public health expenditure have been budgeted in the four silos of hospitals, physicians, community-based care and prescription drugs. Capitation has been used in some degree within these silos (e.g. primary care in Ontario) and to a limited degree across silos, such as the introduction of population-based formulae for hospital and community services in health regions in provinces such as Saskatchewan and Alberta.<sup>109</sup>

In the past decade there has been growing international interest in “Pay-for-Performance” (P4P) whereby financial incentives are used to reward practice behaviours such as prevention screening and management of chronic disease.<sup>110</sup> England has undertaken the most ambitious P4P project with the launch in 2004 of a Quality and Outcomes Framework (QOF) that allocates 655 out of 1000 points to a clinical domain consisting of 80 indicators across 19 clinical areas ranging from coronary heart disease to obesity and smoking. A payment is attached to each point. The QOF program is voluntary but a majority of GPs participate. Practices have scored very well on the QOF. In 2006-2007, the average score in the clinical (quality) decision was 631 out of 655 possible points.<sup>111</sup> The payments made through the QOF are substantial and may represent roughly 20% of total practice income.<sup>112</sup> It was reported that the GP practices earned, on average, £119,000 in 2006-2007 from the QOF<sup>113</sup> (the majority of GPs are in group practice; as of 2005 solo practitioners represented fewer than 6% of the total<sup>114</sup>). Campbell et al. conducted a before and after (QOF was implemented in 2004) study of 42 primary care practices for which quality of care indicators were measured in 1998, 2003 and 2005. They found that while quality of care measures for asthma, coronary heart disease and type 2 diabetes were improving before QOF, there was a modest acceleration in improvement for diabetes and asthma

following the introduction of QOF. They noted further that the rate of improvement for the indicators with a financial incentive between 2003 and 2005 was not significantly different from the rate of improvement in quality indicators without a financial incentive, which they suggested may have been the result of a “halo” effect, i.e. performance on indicators with incentives may have influenced others.<sup>ii115</sup> In an assessment of the 2004 GP services contract that implemented the QOF, the National Audit Office of England noted that the QOF is geared toward intermediate processes of care rather than patient outcomes; “for example, measuring the percentage of heart disease patients that have received treatment rather than a reduction in patients that have heart failure.” It also suggested that the QOF may divert a clinician’s attention away from clinical areas that are not measured.<sup>116(p35)</sup> Doran et al. have examined the effect of the QOF on incentivized and non-incentivized clinical activities over the 2001-2007 period. They found that two and three years into the introduction of the scheme, in the case of incentivized indicators, achievement levels continued to be higher than predicted, and was observed to be lower than predicted among the non-incentivized indicators, with the suggestion that the QOF may have acted to a small detriment of activities that were not rewarded by the scheme.<sup>117</sup>

Fleetcroft and Cookson have also criticized the QOF for not linking the value of the incentive payments to the expected amount of health gain. They examined eight preventive measures in the QOF for which estimates of population health gain were available. They found no relationship between the value of the incentive and health gain. For example they found that the use of angiotensin-converting-enzyme (ACE) inhibitors in heart failure would account for 41% of the maximum lives saved per year across all 8 interventions but would receive just 6% of the total payments, while the screening and treatment of hypertension would account for 10% of

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<sup>ii</sup> They cite, for example, one indicator of control of total serum cholesterol with a financial incentive influencing another of “action being taken if cholesterol is raised” that did not have a financial incentive.

all lives saved and receive 46% of the payments. They concluded that programs such as QOF should link the value of the payment and health gain.<sup>118</sup>

What might be termed a serendipitous result of the QOF was reported in 2008 by Doran et al. based on an examination of QOF results by deprivation quintile over the first three years of the scheme. While they found the lowest QOF score achievement in the most deprived quintile in the first year, the fastest improvements were observed in the most deprived quintiles in the next two years, with the result that the gap in median QOF achievement between the least and most deprived quintiles narrowed from 4.0% to 0.8% over the period.<sup>119</sup>

A further issue that has been raised with the QOF is the uneven distribution of the QOF reward payments, which have mainly accrued to doctors, while practice nurses have played a key role in achieving QOF targets. One qualitative study of doctors and nurses in 22 practices across England reported “that only a small financial bonus had been paid to nursing staff in some (but not all) practices created a sense of resentment among a considerable minority of the nurses.”<sup>120</sup>

P4P has been implemented in a limited fashion in several Canadian provinces. The closest application to the QOF has been Ontario’s program of bonus payments for the achievement of prevention screening and immunization thresholds in new primary care models that were introduced in the early 2000s. To date there has been one comprehensive examination of their impact by Hurley et al., based on a comparison of family physicians eligible for performance incentives with those who were not over the 1998-99 to 2007-08 period. They found that the incentives led to percentage increases of 5.1% for senior flu shots, 7.0% for Pap smears, 2.8% for mammograms and 56.7% for colorectal cancer screening although the absolute increases were modest with the exception of colorectal cancer screening (2.8,1.1,4.1,1.8 and 8.5 percentage point increases respectively).<sup>121</sup> In a more recent examination of the impact of a

diabetes incentive code in Ontario Kiran et al. found that the proportion of Ontarians with diabetes receiving recommended testing increased after the incentive was introduced, but that it was already rising before the introduction of the code. They suggested that physicians who were already providing good diabetes care were more likely to use the incentive code.<sup>122</sup> Other provinces such as British Columbia provide payments for managing and documenting chronic disease according to a clinical practice guideline.<sup>123</sup>

It must be emphasized that the financial incentive itself is just one component of pay-for-performance. It has been demonstrated that physicians will modify their behaviour when provided with information on how their practices compare with their peers.<sup>124</sup> In 2005 the Robert Wood Johnson Foundation (RWJF) reported on key lessons from a major study of seven large US health insurance plans. The lessons stressed the need for accurate data for performance measurement both for physician feedback and public reporting purposes, stating that “frequent, clear and actionable feedback to providers is essential”.<sup>125</sup> RWJF also noted the importance of non-financial incentives such as staffing and infrastructure support.

Moving beyond indicators of processes of care there is growing interest in the ability to measure patient outcomes using generalized instruments that can be administered to general populations to assess Health Related Quality of Life. In 2004, Appleby and Devlin argued that success could be measured in the English National Health Service using measures such as SF-36 and EQ-5D<sup>126</sup> both of which cover several aspects of normal daily functioning.<sup>127</sup> The private British United Provident Association pioneered the adoption of health outcome measures of a number of different operations using the SF-36 and VF-14<sup>128</sup> questionnaires both pre-operatively and at three-month post-op.<sup>129</sup> A 2008 report of the Office of Health Economics put forward 18 recommendations for the collection of outcome data, of which the most pertinent for primary

care are: the identification of a generic measure of health related quality of life suitable for application to mental health patients as well as other kinds of care; the addition of questions on patients' experience of care (e.g., access, choice, communication); and piloting and evaluation of the use of incentives to use patient outcome measures.<sup>130</sup> The report suggests that the QOF could be used to provide GPs with incentives to administer patient outcome questionnaires and that once experience has been gained consideration could be given to rewarding providers in relation to outcomes.<sup>130</sup>

There is growing international interest in outcome and patient-reported outcomes. For example, an international collaboration on outcome measures in rheumatology (OMERACT) that was established in 1992 explored dimensions of patient-reported outcomes at its 2010 conference and reported that the impact of rheumatology conditions on quality of life should consider severity, importance and self-management.<sup>131</sup>

The English NHS has adopted the term Patient Reported Outcome Measures (PROMs) for these applications. Since April 2009 the collection of PROM data, both pre- and post-operatively has been mandated for all licensed providers of NHS-funded hip and knee replacements and groin hernia and varicose vein surgery.<sup>132</sup> The results are now being reported on the website of the NHS Information Centre.<sup>133</sup> In the future PROMs data collection will be extended to primary care. The Oxford University Department of Public Health is presently conducting a PROMs pilot for six long-term conditions in primary care among PCTs in two regions of England. The conditions include asthma, chronic obstructive pulmonary disease, diabetes, epilepsy, heart failure and stroke. The EQ-5D instrument will be used for all six conditions supplemented by condition-specific instruments.<sup>134</sup> In December 2010 the NHS adopted an outcomes framework that is designed to collect data on five domains: prevention of

premature mortality, enhancing quality of life for persons with chronic conditions, recovery from illness and injury, positive care experience and patient safety. In the second domain the intent is to include EQ-5D on the GP Patient Survey, which will be administered to 2.8 million people registered with a GP practice annually from 2011 onwards.<sup>135</sup> The GP Patient Survey was launched in 2007 and has been used to collect patient-reported data at the practice level to reward GPs for achieving access targets.<sup>136</sup>

The foregoing suggests the potential for applying a population health approach within primary care that focuses on the level and distribution of health outcomes. U.S. physician David Kindig advanced a comprehensive proposal to link health care to population health in a 1997 monograph entitled *Purchasing Population Health: Paying for Results*.<sup>137</sup> Kindig linked the U.S. managed care approach to the population health framework with a view to realigning financial incentives and rewards for medical services to improved health outcomes. Kindig went so far as to suggest that payers might withhold a portion of the capitation payment that would be subsequently allocated on the basis of improvement in the disability-adjusted life expectancy of the managed care population (i.e., a focus on eventual or final rather than intermediate or process outcomes). Kindig proposed that this approach might be phased in over a 23-year period, in the following 3 steps:

- Phase One (1997-2000) – Debate, acceptance and research. This phase would see the full realization of the managed care approach in the United States, increased measurement of health outcomes and applied research on the population health framework.
- Phase Two (2001-2010) – Health outcome incentives for fully integrated medical delivery systems. This phase would involve the development of outcome-based payment

systems that would go beyond hospital and physician integration to include prevention, primary care, long-term care and health education.

- Phase Three (2010-2020) – Incorporating non-medical determinants and sectors. Kindig proposed that this phase would involve collaboration between health care delivery systems and schools, social services, the environment (presumably agencies) and public health that might begin with integrated delivery systems investing in these other sectors and evolving to a Health Outcomes Trust that would create “inter-sectoral incentives for health outcome improvement”.<sup>138</sup>

Coincidentally, in 1997 Pronk and O’Connor, employees of HealthPartners, Minneapolis, Minn. (a large, not-for-profit HMO) set out what they called a “systems approach to population health improvement” built around the HMO. They proposed a seven-step process through which an HMO could pursue health goals involving resource allocation, measurement of quality outcomes and ongoing health plan recruitment.<sup>139</sup> In 2005, Stephanie Pronk, writing in the employer-oriented *Benefits Quarterly*, proposed that “population health improvement” represents the next era in health care management. She outlined seven major components of successful improvement plans ranging from assessment, education and disease management to absence management and eHealth.<sup>140</sup>

In 2006, Kindig reflected on his 1997 proposal in light of the growing movement towards P4P and the linkage of provider reimbursement to the achievement of quality targets related to the processes and management of care. He observed that P4P had yet to focus on broader population-level health outcomes such as health-related quality of life, and enumerated several outstanding challenges, including: the design of incentive structures to reward population health improvement across multiple agents (sectors/determinants); coordination across sectors;

resistance to reallocation of resources across sectors; and the ongoing difficulty in focusing attention on upstream determinants.<sup>141</sup>

Since 2006 there has been a proliferation of writing in the U.S. about applications of “population health management” (PHM). Interestingly, this was not defined in Kindig’s 2007 glossary of population health terminology,<sup>142</sup> but in 2002 Hillman described PHM as “the improvement of the health status of the population by focusing on the needs of the health of that population”. He elaborated it further as “the technical field of endeavor which utilizes a variety of individual, organizational and cultural interventions to help improve the morbidity patterns (i.e., the illness and injury burden) and the health care use behavior of defined populations.”<sup>143(p3)</sup> Felt-Lisk and Higgins have defined PHM programs as “a set of interventions designed to maintain and improve people’s health across the full continuum of care – from low-risk, health individuals to high-risk individuals with one or more chronic conditions.”<sup>144(p1)</sup> One of the fundamentals of PHM is an understanding of the distribution of risk in the population that is being cared for. As the U.S. Agency for Health Research and Quality (AHRQ) has suggested there are three major groupings of patients at risk in a provider’s patient panel:

- Groups of patients defined by age and/or gender who need a defined set of preventative or screening services;
- Groups of patients with diagnosed chronic conditions in need of ongoing management; and
- Groups of patients with abnormal test results in need of follow-up services.<sup>145</sup>

However, the identification of such subpopulations was limited to clinical criteria such as “patients needing reminders for preventive care or tests”, and no mention was made of social determinants such as SES.<sup>145</sup>

A further aspect of PHM approaches is the active participation of the patient in wellness programs, often provided by an employer. To date the main incentive for PHM approaches has been the capitation basis for funding managed care organizations through prepaid contracts plus the fact that employers are paying for health insurance and therefore it is to their advantage to keep their premiums in check.

Since 2007 the U.S. Institute for Healthcare Improvement (IHI) has been promoting a greater emphasis on health outcomes through its Triple Aim initiative, which has the following goals, which IHI believes must be pursued simultaneously:

- Improve the patient experience of care (including quality and satisfaction);
- Improving the health of populations; and
- Reducing the per capita cost of care.<sup>146</sup>

U.S. President Barack Obama's 2010 Patient Protection and Affordable Care Act has made two key provisions that will extend the PHM concept further toward Kindig's vision. The first of these is the Accountable Care Organization (ACO). The ACO will comprise a voluntary group of providers including primary care physicians, specialists and hospitals that will take on responsibility for caring for a minimum of 5,000 Medicare patients. The ACOs that meet certain quality standards will be able to share in any cost savings they achieve for the Medicare program.<sup>147</sup> ACOs will be measured against 33 measures in the four domains of patient/care giver experience, care coordination/patient safety, preventative health and at-risk status (e.g., Hemoglobin A1C <8%).<sup>148</sup> Hodach notes that ACOs will require physicians to adopt prevention-oriented population health approaches such as the practice-based population health (PBPH) concept that has been put forward by AHRQ.<sup>149</sup> PBPH focuses heavily on information management beginning with an examination of subpopulations of patients and their

characteristics, followed by creating reminders and tracking performance measures. The connection to Kindig's thinking is evident. "By helping providers focus on the preventative care needs of all of their patients, including those individuals who do not appear in the office for routine care, PBPH can help practices conduct more comprehensive health promotion and disease management."<sup>145(p1)</sup>

The second provision of the legislation is a "meaningful use" regulation for electronic health records that provide payments to providers who achieve a progressively more complex set of objectives beginning with the capture of patient data and extending to the use of clinical decision support tools and electronic prescribing.<sup>150</sup> It has been noted that this will be very challenging as both numerator and denominator data will be required. For example, in order to measure smoking cessation, it will be necessary to identify the number of smokers in the practice and what percentage receive physician counseling.<sup>151</sup> Clearly, the ability to explicitly define the population being cared for is critical. One issue that has been raised with ACOs is the need to ensure that vulnerable populations are not further disadvantaged. Lewis et al. have described two types of vulnerable populations. The first is clinically at-risk populations, such as those with clinical risk factors, and the second is socially disadvantaged groups such as racial minorities, persons living in poverty and those who are socially isolated.<sup>152</sup> As Lewis et al. point out, the potential for providers to either exclude or discharge such patients has been well documented in the literature. They outline nine policies to promote the inclusion of vulnerable populations in ACOs, of which probably the three most critical are:

- Appropriate risk adjustment that reflects the ACO patient composition;
- Incentive systems that reward both incremental and absolute performance, recognizing that vulnerable populations will likely have poorer performance at the outset; and

- Monitoring ACO patient populations to detect risk selection against vulnerable populations.<sup>152</sup>

ACOs are now being formed in the United States. With regard to Phase Three of Kindig's proposal, the establishment of formal linkage or partnerships between health care providers and agencies that can address non-medical determinants of health, this does not appear to have developed to any significant degree as yet. To date inter-sectoral collaboration would appear to have taken place primarily between public health agencies and other community organizations rather than primary care and other acute care providers.<sup>153,154</sup> Prospectively Fawcett et al. have put forward recommendations for the establishment of successful multi-sectoral partnerships for population health and health equity,<sup>155</sup> and Woulfe et al. have proposed critical success factors for multisector partnerships in population health improvement.<sup>156</sup> Recently Hostetter and Klein have documented several examples across the United States of community health partnerships that engage clinicians and other community organizations to address population health issues.<sup>157</sup> Gourevitch et al. have outlined a challenge of addressing non-medical determinants of population health in the context of accountable care. They note that while public health agencies typically define populations on the basis of residential location, health care delivery organizations define them on the basis of their enrolled patients. Hence if a hospital is a dominant provider for a given community, there might be an incentive for addressing neighbourhood-based determinants of health, but if it is serving patients distributed across a number of neighbourhoods that this is unlikely to be the case. They suggest that one approach will be to require ACOs to establish formal partnerships with local public health agencies.<sup>158</sup>

It should be noted that Kindig has not explicitly addressed the issue of interventions or incentives to improve the distribution of health in the population. In 2008 the U.K. House of

Commons Health Committee conducted a study on the role of the NHS in addressing health inequalities. The QOF was cited in the role of primary care in mitigating inequalities, and it was suggested that “there is in fact a disincentive built in to the GP contract funding formula for GPs in deprived areas to proactively identify those people in need.” A witness also criticized some of the QOF incentives, noting that the majority of incentive points for smoking were for recording smoking status as opposed to providing smoking cessation advice. In its conclusion the Committee recommended that, “tackling health inequalities should be an explicit objective during annual QOF negotiations and that this objective should have measurable characteristics which can be evaluated over time.”<sup>159(pp81,83)</sup>

In 2008 Sir Michael Marmot was commissioned to propose evidence-based strategies for reducing health inequalities in England post-2010. A task force reporting to the review commented at length on how QOF payments were adjusted in a manner such that practices with a higher proportion of patients with the relevant conditions receive more remuneration for a given level of achievement, but less per patient. They suggested that this may have resulted in a disincentive to active case-finding, which would have had a larger effect on the more deprived areas where the prevalence of chronic disease is generally greater. This was supported by the finding that the prevalence of most of the conditions with QOF incentives was below that estimated in national population-based surveys.<sup>160</sup> This was addressed in the final report of the review with the recommendation that the QOF be revised, “to ensure that general practices are incentivized to provide 100 per cent coverage of the quality of care for all patients.”<sup>161(p157)</sup> This recommendation was echoed in a 2011 King’s Fund review of the impact of the QOF on health inequalities by Dixon et al. In addition to greater emphasis on proactive case finding, they

suggest providing more incentives for primary prevention and incentives for practices serving deprived populations to invest in appropriate services for their vulnerable patients.<sup>162</sup>

However, there is at least one example of interest in Kindig's proposal that remuneration should be linked to population health outcomes, at least in the United States. In 2007 Wellpoint Inc., a U.S. managed care insurer/provider with 34 million insured members, announced that it would link a portion of its employees' bonuses to a "member health index" (MHI) a composite measure of patients' overall health, including things like emergency room use, receipt of preventative care and medication compliance.<sup>163</sup> In a June, 2008 press release, WellPoint reported that in the first year, improvement was shown in 17 of the 20 clinical areas tracked by the MHI (e.g. screening for breast cancer and colorectal cancer) and that employees received their maximum payout.<sup>164</sup> It is noted, however that the only items of the proprietary MHI specifically mentioned in Wellpoint's news release were intermediate "process" indicators.

One can imagine why there might be reluctance or opposition on the part of providers to Kindig's proposal, particularly among those with smaller practice populations that would be more sensitive to risk. For example, why should providers be held accountable if the patient does not present for treatment? Why should they be held accountable if their practice populations are at particular disadvantage with respect to social determinants of health beyond their control? Moreover, health care remains an art as well as a science in an important measure; therapeutic regimens are far from guaranteed to produce the desired outcomes. Third, a longstanding issue in the health promotion field is the long lag time between prevention efforts and outcome benefits.

### *Population health and medical education and training in Canada*

Just as Canada led the way in developing and promulgating the Evans and Stoddart population health framework, it has also been a leader in incorporating it in medical education and postgraduate training. The origins of population health in the general education of physicians in Canada (aside from the specialty training of physicians in public health and preventive medicine) date back to before 1990 with the launch of the Educating Future Physicians for Ontario (EFPO) project. One of its objectives was to define the health needs of Ontario society as they relate to the education of physicians. Several of the roles identified in EFPO emphasize the need for increased training in community-based settings, understanding of all determinants and their implications for clinical practice and the role of advocacy for public health issues.<sup>165</sup> In the mid-1990s, EFPO's approach was first adopted by the Royal College of Physicians and Surgeons of Canada (Royal College) in the CanMEDS 2000 project that was intended to set out new roles and competencies for specialist physicians. The "health advocate" is one of seven core roles for physicians set out in the CanMEDS framework and it calls for the physician to be able to apply an understanding of the determinants of health and appropriate advocacy at the level of the patient, the practice and the population. It specifies four key competencies that require the physician to be able to:

- "respond to individual patient health needs and issues as part of patient care;
- respond to the health needs of the communities they serve;
- identify the determinants of health of the populations that they serve; and to
- promote the health of individual patients, communities and populations."<sup>166(p19)</sup>

The Royal College has since been implementing the CanMEDS roles in the postgraduate training programs that it accredits in the 17 medical schools across Canada.

The College of Family Physicians of Canada (CFPC) includes “the family physician is a resource to a defined practice population” among the four principles of family medicine. The principle suggests that the practice is viewed as a “population at risk” and that it should be organized to ensure that patients’ health is maintained whether or not they are visiting the office.<sup>167</sup> The CFPC has also adopted the CanMEDS framework and in 2011 set out a new competency-based curriculum. The health advocate role includes population health-related competencies such as:

- “identify vulnerable or marginalized populations and respond as needed; and
- describe approaches to implementing changes in determinants of health of the population serviced.”<sup>168(P18)</sup>

Both the Royal College and the CFPC recognize the need for individual and collective action for health advocacy. The CFPC includes “collective actions with other health professionals in influencing population health and public policy”<sup>168(P17)</sup> Writing on the issue of medical professionalism in the United States, Lesser et al. have added an additional dimension, namely the role of physician advocacy and professional organizations. In terms of how physicians can promote the value of “fair and ethical stewardship of health care resources” they suggest that in their interactions with patients individual physicians can do so by respecting the needs and preferences of subpopulations in their practices. They then suggest that medical organizations can “promote public health and advocate on behalf of societal interests with respect to health and health care, without concern for the self-interest of the individual physician or the profession.”<sup>169(p2735)</sup> In the Canadian context, Huth and Raphael have suggested that medical associations are one avenue whereby medical students can become involved in advocacy on social determinants of health and they provide several examples.<sup>170</sup>

There has been little published research on the uptake of the CanMEDS roles among Canadian physicians. In one small study Stutsky et al. surveyed specialist and family physicians on the importance of the CanMEDS roles and competencies. Of the seven roles they found that the health advocate role was rated the lowest in terms of overall importance. They speculated that in the case of specialist physicians, time constraints might not have allowed for health advocacy activities.<sup>171</sup> Looking to the future Dharamsi et al. suggest that the recent establishment of accreditation standards that require service-learning opportunities in medical education will facilitate the acquisition of health advocacy competencies.<sup>172</sup> Service learning is defined by the Liaison Committee on Medical Education that accredits Canadian and U.S. medical schools as “a structured learning experience the combines community service with preparation and reflection.”<sup>173(p5)</sup>

Given the emphasis on multidisciplinary teams in primary care reform the collaborator role defined by the CFPC will become increasingly important. Key competencies of the collaborator role include participating in collaborative team-based models of care and promoting a positive environment for team-based care.<sup>168</sup> In 2011 the CFPC adopted a position paper on the “Patient’s Medical Home”(PMH) that recommends that the PMH should address the health needs of the individuals and populations they serve: “incorporating the effects that social determinants such as poverty, job loss, culture, gender and homelessness have on health”.<sup>174(p13)</sup>

The Medical Council of Canada (MCC) has developed seven population health objectives that are included on the qualifying examination that is a prerequisite for medical graduates to become licensed to practice in Canada:

- “concepts of health and its determinants;
- assessing and measuring health status at the population level;

- interventions at the population level;
- administration of effective health programs at the population level;
- outbreak management;
- environment; and
- health of special populations.<sup>175(p78)</sup>

These objectives emphasize the roles that physicians can play as advocates for community-wide interventions and also how physicians can improve health equity by understanding the variation in the risk profiles of their practice populations and adjusting services accordingly. As described in detail by the MCC, the “health of special populations” goes beyond clinical risk factors to include Aboriginal peoples, immigrants, persons with disabilities, homeless persons and vulnerable groups, including isolated seniors and children living in poverty.<sup>175</sup> This is in contrast to the previously cited clinical criteria of the AHRQ.<sup>145</sup>

The Association of Faculties of Medicine of Canada (AFMC) has a Public Health Task Group that developed a vision paper in 2006. The paper includes a broad definition of a population health approach that “takes into account the potential effects of social connectedness, economic inequality, social norms and public policies on health-related behaviours and on health status”.<sup>176(p6)</sup> The task group envisions that all Canadian medical graduates should be able to incorporate public health concepts in day-to-day clinical practice. With the support of PHAC, AFMC has established a Public Health Educators’ Network (PHEN) to foster public health education at the undergraduate education and postgraduate training levels. The PHEN has developed a comprehensive textbook on the theory, methods and practice of population health.<sup>177</sup>

The incorporation of population health concepts in medical faculties is also taking place internationally. In the United States the Healthy People Curriculum Task Force has developed a

Clinical Prevention and Population Health Framework intended for use by a range of health professions that includes 19 domains set out in four areas:

- evidence base of practice (e.g. measurement of outcomes);
- clinical preventive services – health promotion;
- health systems and health policy; and
- community aspects of practice.<sup>178</sup>

Most recently, Shortell has nicely summarized the foregoing by setting out three key roles/activities for the physician as a public health professional in the 21<sup>st</sup> century:

- “consider individual patients within the larger social, economic, and cultural context;
- form partnerships with local health departments, other community-based health organizations, schools and employers; and
- influence the larger political and policy debates regarding the social and environmental determinants of health as they interact with the biological and behavioral determinants.”<sup>179(pp2916,2917)</sup>

At the clinical policy and practice level, however, the application of population health is not far advanced. In 2007 the Australian Medical Association adopted a position statement on social determinants of health and prevention of inequities. The majority of its 20 recommendations are directed at governments, but there is one that encourages doctors to ensure that their treatment decisions contribute to health equity for individuals and communities and to be mindful of the role of social determinants in patients’ lives during consultations.<sup>180</sup> In 2012 the CMA adopted a policy statement on the role of the medical profession in health equity and

the social determinants of health. It contains 18 recommendations targeted at medical education and medical practice, including:

- “greater integration of information on social determinants of health in medical education to support the CanMEDS health advocate role; and
- tools for practising physicians to assess patients for social and economic causes of ill health and to factor these into treatment plans.”<sup>181(pp4,6)</sup>

Consideration of a population health perspective will likely pose ethical challenges for some physicians. One such challenge will be the allocation of resources between treatment and prevention. In its curriculum for general practice the Royal Australian College of General Practitioners notes that “general practitioners need to understand their professional and ethical obligations to the patient and the broader community.”<sup>182(p172)</sup> A second ethical challenge could arise from targeting resources at population subgroups in order to achieve equity objectives. This appears to be relatively unexplored to date, although Tsuchiya and Dolan reported that when asked to choose between two hypothetical programs, NHS physicians were more likely than the general public to choose an option that would increase the life expectancy of the highest and lowest social classes by the same amount, over an option that would leave the life expectancy of the highest class the same while increasing that of the lowest class by four years.<sup>183</sup>

In light of the foregoing it may be asked “what has been the uptake of population health in the health care system?”

### ***Previous research on health care and population health***

Most of the published research to date on the adoption of “population health” in the health care sector has focused on the determinants of health, with some limited work on inter-

sectoral linkages. First, in the area of determinants, in 2003 the Canadian Population Health Initiative sponsored a public opinion survey among 1,200 Canadians on attitudes toward the determinants of health. The survey showed that there was much stronger acceptance of the impact of the behavioural and lifestyle determinants than the social and economic determinants. For example, 80 percent agreed that whether a person smokes has an impact on health, compared to just 33% who agreed that income or education has an impact.<sup>184</sup> A 2009 survey conducted for the CMA among the general public found similar results. When asked about the impact of each of 17 various factors on a person's health, the top three reported by the public were tobacco use, stress and diet and nutrition, with 60%, 51% and 49% of respondents reporting great impact respectively. In contrast, income level was reported as having a great impact by fewer than three in 10 respondents (27%) and education level by fewer than one in five (18%).<sup>185</sup>

In 2000 Lavis et al. surveyed Canadian federal civil servants in different departments (finance, labour, social services and health) about their awareness of, attitudes toward and self-reported use of ideas about the determinants. The areas they probed included: impact of specific determinants of health; awareness of specific policy documents in population health; attitudes toward implementing a population health approach; attitudes toward specific population health investments; and use of population health concepts in practice. Their findings showed that policy-makers were generally supportive of a population health approach, with the exception of those in finance departments who did not believe that health determinants should be considered in all major government initiatives. More than half of the respondents were familiar with research on the impact of specific determinants of health and a majority felt that these determinants have practical policy applications. Interestingly less than one-third reported familiarity with landmark Canadian reports on the determinants of health such as the Lalonde

report.<sup>186</sup> This study has since been replicated in 2003 among New Zealand policy-makers with similar results.<sup>187</sup> In the health care system, Adily and Ward surveyed professional staff in the Division of Population Health in Sydney, New South Wales, in 2002 with regard to the importance of and barriers to evidence-based practice (EBP) in population health. Although 56% of respondents agreed that there is a lack of evidence in many areas of population health, 60% disagreed that EBP is of limited value because of the lack of a scientific base.<sup>188</sup> In further analysis of the data they identified unmet needs for training and skills development for EBP in population health.<sup>189</sup>

Frankish et al. surveyed senior staff officials in departments such as health promotion and public health in 107 health regions across Canada in 2003 with respect to their level of action and inter-sectoral collaboration on 10 non-medical determinants of health (as set out by PHAC). They found that many health regions reported having had at least an initial discussion on addressing non-medical determinants; healthy child development and personal health practices received the greatest amount of attention. Similarly, the greatest amount of inter-sectoral collaboration was reported for these two determinants. Half of the respondents indicated that they had established inter-sectoral programs for personal health practices and healthy child development, while just one in four reported that they had established inter-sectoral programs for income and social status (23%) or education (25.3%).<sup>190</sup> Cohen surveyed three diverse health regions in Manitoba through the conduct of 61 semi-structured interviews with board members and staff. She found that while interviewees understood population health as a tool for assessing and understanding the factors influencing population health in their region, few participants defined population health as an approach to taking action on the determinants of health. She also reported that only 2 of 61 participants mentioned the need to reduce social and economic

inequalities in health status.<sup>191</sup> As part of a case study of how the Saskatoon Health Region addressed the population health perspective in its accreditation, Gibson conducted 20 key informant interviews with health region staff who were serving on the accreditation teams. Gibson reported that senior management staff demonstrated a clear understanding of the concept of population health. Some frontline staff were unable to describe it but did understand the concept of non-medical determinants of health. In terms of programs, Gibson reported that senior management understood the need for partnerships with government and community-based organizations. Gibson's main conclusion was that education about measurement, non-medical determinants and policy affecting those determinants should be offered to health region employees.<sup>192</sup>

Kindig has stressed resource allocation between sectors in his proposed model. In Canada the issue of resource allocation across determinants of health has been studied on Prince Edward Island by Eyles and colleagues as part of an evaluation of regionalization conducted by the Department of Health and Social Services in the late 1990s. Prince Edward Island's implementation of regionalization was unique in Canada in that five regions were created with block budgets to cover a wide range of health, social and employment services. Part of the evaluation focused on attitudes towards the determinants of health among a wide range of stakeholders, including regional board members, managers, frontline staff and family physicians. The public were surveyed as well using a slightly different approach to asking the questions. In terms of ratings of the determinants of health there was consistency across all stakeholders. A majority in all groups ranked personal health practices and employment as one of the top three determinants of health, while social support, education and the physical environment were considered to be less important as determinants of health. When these groups were asked for the

top three determinants to which resources should be shifted there was much greater variation across stakeholder groups and providers. To compare the responses of just two of the stakeholder groups, senior managers chose healthy child development, employment and personal health practices as the top three targets for reallocation, while family physicians chose personal health practices, formal health care and a tied rank of education/healthy child development as most important.<sup>193</sup>

In further research on Prince Edward Island, Eyles and colleagues conducted key informant interviews in 1998 and 1999 to assess the extent of cross-sectoral resource allocations. The informants identified 74 cross-sectional allocations, two-thirds of which involved staff, space, equipment and information. Twenty-five involved financial transfers, mainly within sectors, some of which reallocated money from community programs to hospital care, which was contrary to the initial intent of the regionalization initiative. They reported that most cross-sectional resource allocation occurred within the human services system, although some did involve other sectors, particularly education. Based on this research, Eyles et al. identified several considerations to guide resource reallocation, including the need for general acceptance of the idea of population health by the employees charged with it, the need to engage stakeholders (e.g. physicians, unions) in the process as partners, and the need to provide flexibility in budgetary allocation.<sup>194</sup> In their 2006 revisitation of this research, Stoddart et al. noted that in 2002 hospital services were removed from the block budgets, which they suggested would reduce the likelihood of reallocation from acute care.<sup>195</sup>

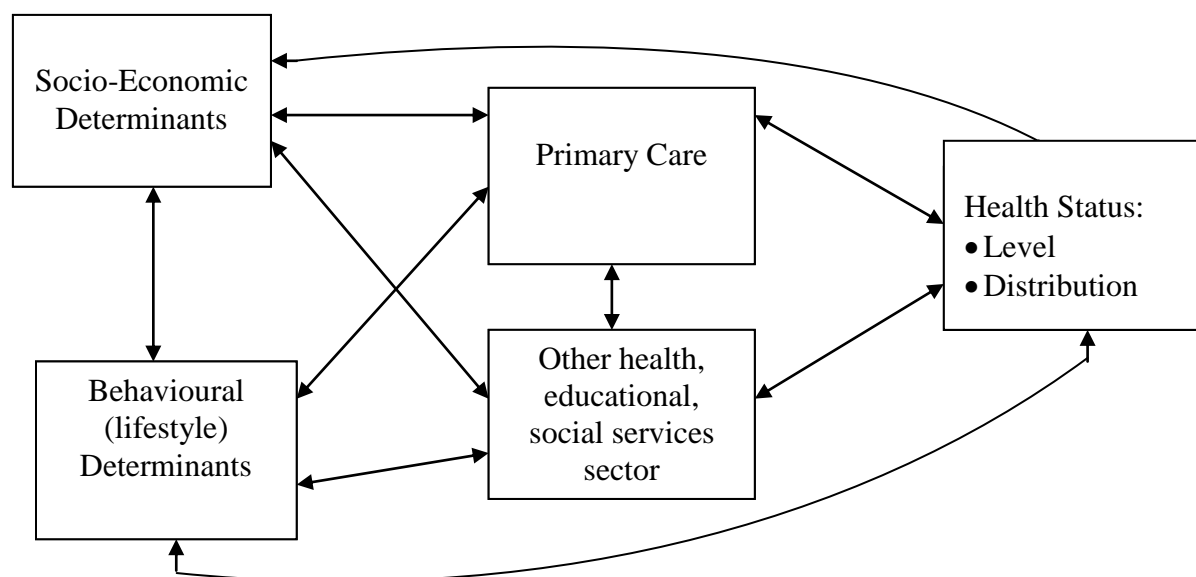
In summary, while tools are being developed that could facilitate the incorporation of population health in primary care, there has been little research either among frontline providers,

or on the linkage between primary care and other social determinants of health and the relative allocation of resources to each.

### *Conceptual framework*

Based on the foregoing review of the policy literature and its application and assessment in the health field to date, a conceptual framework is set out in Figure A below:

**Figure A: Conceptual Framework: Primary Care and Population Health**



The framework is intended to provide a rough schematic of the relationships between the determinants of health and with a focus on the role that primary care may play in intervening in them. Bi-directional arrows are used since most of the empirical work on the population health framework to date has been based on the correlational analysis of cross-sectional data. For example Arah and Westert have conducted correlational analysis of non-medical determinants and health outcomes for the Canadian provinces and territories using 2001-2003 data from the

population-based Canadian Community Health Survey and from the Canadian Institute for Health Information. Commenting on some of their findings that were counter to what they were expecting to find (e.g. a negative correlation between health expenditure and life expectancy) they observed that “it is difficult to say which indicator precedes the other in this study.”<sup>196(p10)</sup> The conceptual framework was used as a guide for the development of the semi-structured interviews that were conducted. It is by no means complete. It does not take into account for example, the presumably beneficial effects of referral from primary care to secondary and tertiary care. Such referrals are frequent. A Statistics Canada survey of experience with primary health care in 2007 found that 35% of the population aged 18+ had been referred for specialist care in the previous 12 months.<sup>197</sup> However the effect of specialist care on population health has not been studied to the same extent as that of primary care and the results are mixed. In one study Starfield et al. examined mortality in relation to the supply of primary care and specialist physicians across 3,075 U.S. counties over the 1996-2000 period. They found that a higher primary care physician-to-population ratio was associated with lower mortality while a higher specialist-to-population ratio was associated with higher mortality.<sup>198</sup> On the other hand Arah and Westert found that both primary care and specialist physician-to-population ratios were positively correlated to life expectancy at birth and that a higher correlation was observed for the specialist-to-population ratio.<sup>196</sup>

### ***Research objectives and questions***

The foregoing has described how health care became marginalized as one of the determinants of health over the roughly 15-year period between the Lalonde report and the widespread uptake of the Evans and Stoddart population health framework in the 1990s. Since 2000 there has been renewed interest in, and macro-level evidence for, the role that health care,

and primary care in particular, can play in contributing to better health, although there is continued debate about the appropriate breadth of the concepts (i.e. primary care versus primary medical care). While there have been some studies of how health care can interrelate with other elements of the population health framework, they have been conducted, for the most part, at the level of policy-making and administration, and no studies have been identified that have collected data among primary care physicians. According to Statistics Canada, 85% of the population aged 12 or older has a regular medical doctor, and in 2010 almost eight out of 10 (81%) had consulted a family doctor at least once during the previous year. There is variation across the provinces, ranging from 75% reporting having a family doctor in Quebec to 94% in Nova Scotia.<sup>199</sup> This is consistent with estimates from other survey data sources, such as a 2008 sample survey by Decima Research which estimated that 86% of the population has a family doctor.<sup>200</sup> This would suggest that family doctors are a key group within which to explore the potential for application of and engagement with the population health framework. Considering the foregoing, the following objectives and research questions are set out below.

The research objectives and questions are set out with reference to what I will term the patient panel (panel) of the physician. This will be defined as the number of patients for which the physician has an active chart (i.e. the patient comes in at least occasionally).

Objective 1. Determine awareness and salience of the concepts of “population health” and social determinants of health among primary care physicians.

1.1 What opportunities do primary care physicians have to address the determinants of health and what are the constraints to realizing them?

1.2. What types and extent of health status inequalities do primary care physicians perceive within their panels and what might be their role in reducing them?

Objective 2. Assess the balance of “upstream” preventive and “downstream” acute treatment activities in practice.

2.1. What is the perceived desirable “upstream-downstream” balance of prevention versus treatment among primary care physicians and what, if any, are the barriers to achieving that?

2.2 What are the barriers to deploying existing tools and strategies to promote population health in primary care practice?

Objective 3. Assess the readiness of primary care physicians to adopt tools and incentives (e.g. pay-for-performance) toward applying a population health approach in primary care practice.

3.1 What supports are required by primary care physicians to apply emerging approaches such as primary care indicators, equity audit and accreditation within their practice populations?

3.2 What is the role of incentives to promote population health approaches in primary care?

Objective 4. Assess current and potential linkages between primary care and other sectors.

4.1 What is the potential for meaningful inter-sectoral links between primary care and sectors linked to determinants of health – e.g., education?

## CHAPTER 2.

### METHODS

#### *Study design*

The study design chosen for this research was that of an exploratory case study. As Yin has noted this method is appropriate when research is addressing descriptive questions.<sup>201</sup> As described previously there has been little if any research published that has explored the basic concepts of population health and the elements of a population health approach among those working in the health care system. There have been a limited number of surveys among policy-makers, administrators and the general public on the array of social determinants of health but none of them has concentrated on frontline clinicians. While other key elements of a population health approach such as tools to assess health equity and P4P have become more widely disseminated, and in some cases implemented in the last decade, the research has been limited, especially among frontline clinicians. Given the lack of research in the area the use of semi-structured interviews with open-ended questions was chosen to collect the data. As will be described further below, the Alberta Primary Care Network (PCN) can be considered as a “case” in that there is a common underlying legal agreement, structure and funding model that applies across all networks and the physician practices contained therein, and a common overlay of support programs that will be described below.

The research questions were examined by conducting semi-structured interviews among 24 primary care physicians in Alberta, Canada. The rationale for this study population and setting follows. Canada in general lends itself well to this topic. One reason has been the prominent attention given to primary care by governments over the past decade, starting with the 2000 Health Accord and the PHCTF, as previously discussed. A second reason has been an

increased focus on health indicators and the relationships among them. In a subsequent Accord in 2003, First Ministers committed to adopting and reporting on a set of some 40 common indicators covering the topics of timely access, quality, sustainability and health status.<sup>60</sup> The Canadian Institute for Health Information (CIHI) has developed a set of 105 Primary Care Indicators that cover 8 dimensions including topics such as “enhancing population orientation”, primary and secondary prevention and treatment goals and outcomes.<sup>202</sup> The intent is that primary care providers would be able to capture and report data, although clearly it will be necessary for physicians to be operating in an electronic environment to do so. CIHI has also developed a subset of 30 core indicators (Appendix A).<sup>203</sup> The subset of indicators was used in the interviews to assess their readiness to adopt tools such as primary care indicators that could be captured in part through the EMR.

### ***Why Alberta Primary Care Networks?***

Within Canada the province of Alberta is particularly well-suited to explore the uptake of the population health approach/perspective among primary care providers. Alberta used its share of PHCTF funds to develop the concept of PCNs in 2003. The goal of the PCN initiative is to improve access to primary care in Alberta and to increase the emphasis on health promotion, disease and injury prevention and chronic disease management as well as to improve coordination of primary care with other health services. The Alberta PCNs are particularly pertinent to the foregoing discussion of the population health approach. With regard to the inter-sectoral emphasis of population health, PCNs are required to deliver a basket of 16 primary care services to their practice populations, including (*xvi*) *Population Health* (not defined) as well as services that relate to linkages within or between primary health care and other areas such as home care and public health.<sup>204</sup> Since its inception the PCN program has been a joint venture

between Alberta Health and Wellness, Alberta's health regions (consolidated to the single region Alberta Health Services (AHS) in 2008) and the Alberta Medical Association (AMA). The PCNs have been established under one of two legal models, both of which involve the formation of a physician not-for-profit corporation and a joint venture agreement with AHS.<sup>205</sup> Something unique to PCNs compared to other primary reform models in Canada is that the funding model includes a \$50 per-capita annual payment. The per-capita funding has two purposes:

- providing new services or enhancements by other providers (e.g., nursing, pharmacy); and
- paying for physician services not otherwise remunerated such as supervising other health care providers and managing multi-disciplinary team functions.<sup>206</sup> The per-capita funding is provided either to the PCN or to the not-for-profit corporation and not to individual physicians.

Every has reported how PCNs have supported the development of multidisciplinary clinics such as the Edmonton South PCN with 60 family physicians, 13 nurses, 4 mental health navigators<sup>iii</sup> and one dietician.<sup>207</sup> The uptake of PCNs among Alberta's family physicians has been rapid. The first ones were launched in 2005 and by the time the research was designed, there were 31 in operation involving more than 50% of Alberta's family physicians. As of November 2011 there were 40 PCNs that encompassed about 80% of Alberta family physicians.<sup>208</sup>

Alberta has had considerable exposure to population health concepts and health indicators. In 2005 the Edmonton Social Planning Council produced a social determinants of health framework for Alberta that sets out nine priority strategies to promote awareness, dialogue

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<sup>iii</sup> A navigator is a fairly recent term that originates in the field of cancer care. The navigator works with members of the care team, family and community groups to provide information to patients about their disease, and the treatments and options that patients may receive.

and collaboration among and between sectors.<sup>51</sup> As regards indicators, the Health Quality Council of Alberta commissioned Ipsos-Reid in 2003, 2004 and 2006 to survey the Alberta population across each of the nine health regions to determine their perception of and experience with the quality of, and satisfaction with, the health care services in the province.<sup>209</sup> In 2010 AHS launched an action plan for health promotion and disease and illness prevention. The plan calls for action in five key areas, one of which is social and physical environments. The significance of income disparities is identified in the social environment, and it is estimated that 20% of health spending may be attributed to the health inequalities that result from income disparity.<sup>210</sup> A framework for reducing disparities is in development. In July 2011, AHS issued a glossary of terminology related to health equity.<sup>211</sup> In terms of the potential to capture indicator data at the practice level, Alberta physicians stand out in front of those in other jurisdictions in their use of electronic health records. On the 2010 National Physician Survey, 38.3% of Alberta family physicians reported using electronic patient records as their main method of record keeping - compared to just 21.5% nationally.<sup>212</sup> Moreover, the PCNs in Alberta have developed a program called Access Improvement Measures (AIM), which is a data-based approach to improving patient access.<sup>213</sup> While this is fairly limited as regards a broader population health indicator framework, it is a step forward, because physicians are required to look at their entire population of patients and there is a focus on measurement and improvement.

In 2008 the AMA negotiated funding for a voluntary Performance and Diligence Indicators (PDI) program which was intended to be a P4P-type program by providing payments to family physicians “who meet specific performance and/or diligence indicators that deliver substantive clinical value.” This program was to be implemented in two phases. In the first phase participating physicians were provided a list of patients that was determined from administrative

fee-for-service billing data and asked to reconcile the list against their own records. In a second step the physicians were then asked to confirm with each patient on their list that they were the patient's most responsible physician. The physicians were paid \$3.50 per patient for each of the two steps.<sup>214</sup> More than 1,000 family physicians (roughly 25% of the provincial total<sup>215</sup>) signed up for the program in 2009 and the first phase proceeded through 2010. The second phase of the PDI program was to comprise an incentive to achieve performance indicators. Physicians were to select one indicator in each of the areas of access, continuity of care and screening and up to two additional indicators. Other indicator areas included diagnosis and patient management. The proposed indicators were similar to those of the QOF. For example the indicator proposed for diabetes management was the "percentage of patients from the physician Validated Patient List diagnosed with Type II Diabetes whose HbA1C level is or below an individualized target for last measured HbA1C".<sup>216</sup> As the PDI was implemented difficulties were encountered with Phase II and it was announced in December 2010 that Phase I would continue for the enrolled physicians until March 31, 2011 and that Phase II would not be implemented.<sup>217</sup> In a March 2011 report, staff responsible for the PDI program reflected on a number of challenges that had arisen for Phase II:

- The indicators had to be focused at the individual physician, whereas the level of the PCN might have been more appropriate;
- The "uneven playing field" resulting from practice setting variation might have resulted in only rewarding top performers;
- The risk of creating inappropriate incentives (e.g., HbA1C targets not appropriate for all patients);
- The future challenge of shifting from process to outcome indicators;

- The support and information technology (IT) challenges associated with a comprehensive framework of indicators (especially given an uneven IT landscape); and
- The time and effort that would be required of physicians to implement the indicators.<sup>218</sup>

### *Sampling strategy*

In terms of sampling strategy, a stratified purposeful sample of eight PCNS was chosen to allow for consideration of variation in size and location. Eight PCNs were selected, two selected from each of four cells of size (small, large) and location (urban, rural). The distribution of the size and location of the 31 PCNs in operation as of 2009 are shown in Appendix B. The detailed rationale for stratifying by these variables is shown in Appendix C.

The eight PCNs were selected with the assistance of the AMA staff based on their considerations of the stage of development and likelihood of cooperation. Consideration was also given to distance of travel, hence more or less rural locations were identified within a fairly short distance of Edmonton and Calgary. PCNs require the identification of a lead physician(s) and the AMA supports a committee of the lead PCN physicians. AMA staff informed the committee of my planned research in 2009. Following a protocol approved by the University of Ottawa Health Sciences and Science Research Ethics Board (Appendix G), I wrote to a lead physician in each PCN to request an interview with them and also to identify two colleagues to pass my request onto and to invite them to contact me. (Appendix D). This approach was generally successful. It was necessary to contact 10 PCNs in order to secure interviews in 8, as there were two instances where I did not receive a response after an initial letter and one follow-up attempt via email. However, I do not believe that the two PCNs I did not hear from posed any bias to the sample. They were both considered successful.

To summarize the rationale for the PCN sample selection, based on the national experience, physicians in larger practices report better access to other services, particularly those in interprofessional practices. From a rural-urban perspective Appendix C shows that while urban physicians reported slightly better access to specialists, those in rural areas report better access to non-medical psychosocial support services. From the perspective of the needs of the patient population a report of the Canadian Institute for Health Information has summarized the situation of rural Canadians by noting that they have poor socio-economic conditions, lower education, less healthy lifestyles and higher mortality rates than their urban counterparts.<sup>219</sup>

In terms of sample size, I chose to conduct 24 semi-structured interviews (3 in each of 8 PCNs) that were originally intended to be completed over a two-month period. A key consideration in determining sample size is data saturation. Guest et al. have reported on an experiment on data saturation in a study of sexual behaviour among 60 women in Ghana and Nigeria. Out of the total of 109 codes they developed, 73% were identified in the first 6 interviews and 92% were identified in the first 12. Of the 36 code definition changes that were made during the analysis, 86% were made during the first 24 interviews and 100% after the first 36.<sup>220</sup> More recently, Siström interviewed 16 U.S. policymakers about population health concepts and reported that saturation of ideas occurred by the 12<sup>th</sup> interview.<sup>221</sup>

Whereas the protocol called for the lead physician to invite their colleagues to contact me, in most cases the lead physician first secured their colleagues' intent to cooperate and then obtained their express consent to provide me with their contact information so that I could follow up to arrange an interview. Three interviews were conducted in each of the eight PCNs with the sole exception of one PCN where the lead physician recommended a colleague in a neighbouring PCN.

Twenty-four face-to-face interviews were conducted over the May, 2010 to June, 2011 period. Twenty interviews were conducted in the physician's office, two were conducted in physicians' homes and two were conducted in coffee shops.

The interviews were conducted using the approved protocol shown in Appendix E. All participants agreed to be digitally recorded by signing the consent letter shown in Appendix F. The interviews ranged in length from just over 20 minutes to 2.5 hours with most ranging from 40-50 minutes. All interviews were transcribed by a transcriptionist who signed a confidentiality agreement. A hard copy of the transcription was mailed to each interviewee with an invitation to provide correction or clarification. Two acknowledgements were received, with no suggested changes.

The approach used for this research does have limitations with respect to generalizability. First, most of the physicians interviewed were "early adopters" of the PCN model. Also, without exception, the physicians were using EMRs. Second, the effect of the introduction of the PDI program was evident. The introductory question of the interview protocol asked about the size of the practice and virtually every physician mentioned having completed the first phase of the PDI and could estimate their patient population to the nearest 100 patients. Moreover, in interviews conducted in late Fall 2010, two physicians mentioned the controversy about the selection of indicators for Phase II of the PDI program. One physician in particular referred to a research study that found that aggressive management of blood glucose had resulted in higher risk of mortality, when expressing his reservation about the proposed indicators for Phase II.

### *Approach to coding*

The data were coded manually using a two-stage approach. In the first stage a matrix was developed in which the response for each physician was recorded for each question as had been captured in my field notes. This provided a preliminary identification of a coding scheme for the responses to each question. The transcribed interviews resulted in 451 pages of transcript in WORD format. In order to facilitate annotation and coding, the transcripts were reorganized into 12 WORD files each containing all 24 responses to the major questions. In order to assess the relative importance of the reporting of various responses (e.g. determinants of health), frequency counts were tabulated across the responses. One level of coding was sufficient for the responses to most of the questions. Three questions resulted in a second level of response. On the question about the presence of health inequalities in the panel population, in addition to citing groups such as Aboriginal peoples and socio-economic status, the physicians went on to describe underlying causes. In response to the question about the physician role in mitigating health inequalities the physicians who cited collaborative team approaches enumerated several activities of their team members to mitigate health inequalities. In their critiques of P4P, the physicians identified several issues, with the issue of risk being further classified into three categories. However, given the small number of interviews the second level of response to these questions comprised essentially unique responses.

## CHAPTER 3.

### DESCRIBING THE PANEL AND DEFINING POPULATION HEALTH

#### *Basic physician demographics*

The physicians that I interviewed were compared against the Alberta population of family physicians on the basic characteristics of gender and experience in practice. Experience in practice was determined by looking up the MD graduation year in the Canadian Medical Directory<sup>222</sup>, as it was not asked in the interview protocol. Experience for the Alberta population of family physicians was determined from the CMA Masterfile that contains basic information on all physicians in Canada (regardless of their CMA membership status).

The physicians that were interviewed were, on average, 26 years beyond their MD degree, compared to 23 years for all Alberta family physicians. One-quarter of the physicians were female, compared to 34% among Alberta physicians who were 20 years or more beyond receipt of their MD degree. While female physicians were slightly under-represented, and the interview group somewhat more experienced than the population as a whole, on the basis of these characteristics the group interviewed was not markedly different than the Alberta family physician population as a whole.

#### *Panel size and visit frequency*

As a result of both having an EMR and having participated in the first phase of the PDI program all physicians were able to estimate the size of their practice populations (panels) to roughly the nearest 100 patients. Almost equal numbers of physicians reported having between 1,500 and 2,000 patients or 2,000 or more patients. Physicians reporting the largest patient panels tended to be in the rural PCNs, where the largest single panel was 2,800 patients. A small number of physicians answered the question on the basis of an aggregate number of patients

ranging between 5,000 to 10,000 that were seen by a group of 4 or 5 physicians. In two of these cases the practices had a special focus on woman's health issues. A small number of physicians reported having fewer than 1,000 patients. In some of these cases, the physician was spending a significant proportion of their time in specific activities such as palliative care and occupational medicine. In one case the physician was winding down towards retirement. Just one physician answered this question from Kindig's perspective of population health care by referring to a catchment population of 92,000 that was being served by 110 physicians.

While all physicians were able to estimate the size of their panels fairly precisely, only one provided a precise estimate the proportion of his panel that had come in for an appointment within the past 12 months, and this was because he had reviewed the interview protocol beforehand and had asked his office manager for assistance. The office manager was able to determine that 1,800 of his 2,084 panel patients had come in at least once (86%). A few physicians were able to derive estimates from fairly precise knowledge of their panel visit rates: "so we have an average visit per year rate overall of 2.6. And mine is about 3.2. But overall, we feel that we see about 2/3 every year." (R7) One physician reported that it was mandatory in her practice for all patients to come in annually and that her office did outreach to ensure these visits: "we actually have a gal who phones everybody once a year. And we have a diary card system, which is being computerized. So that everybody gets three phone calls over a few month periods to allow them the time to get in." (R18) Roughly one-third each of the physicians estimated that either 50 or 70% of their patients come in at least annually while just three physicians estimated in the range of 30-40%. A commonly cited issue in Canadian primary care is the tendency for patients to seek care at places other than their own family physician such as walk-in clinics that might be more conveniently located or have extended hours. Interestingly only two of

the 24 physicians cited this as an issue and lamented it: “so that’s what I’ve noticed particularly in the last 10 years is that I have tended not to be dealing with their acute problems, which is sad because I think that’s where a lot of really good medicine tends to happen.” (R16) The other physician citing this issue noted that “for every visit that they come to see us there is also happening a visit to a primary care walk-in kind of clinic.” (R4) He also noted that his practice had closed their after-hours clinic because patients were going elsewhere for convenience.

In any case, these physician reports bear out the findings of Statistics Canada’s survey research that a majority of the population sees a physician at least once a year.

### ***Describing the panel***

Based on their responses to an open-ended question about describing their panels, nine different dimensions emerged, several of which are related to the determinants of health set out by PHAC, while others were related to the physician’s practice style. Most physicians cited four or five dimensions, although a small number cited only two.

In descending order of the frequency with which they were cited, these were:

- Age distribution - 20;
- Socio-economic status - 16;
- Ethnic identity and religion - 9;
- Disease profile - 9;
- Geographic locale of the panel patients - 7;
- Gender distribution - 6;
- The life-cycle of the physician’s practice - 6;
- The type of medical practice - 6; and
- The lifestyle of the panel - 2.

### *Age distribution*

By far the most frequently cited descriptor of the panel was the age distribution, specifically the prevalence of older patients: “we are a little skewed on to more elderly” (R4), “we’re older. We have 50% senior citizens.” (R5) More than three out of four physicians made reference to the age distribution. Only one referred to the lower propensity of young males to come in for appointments. One dimension emerged that is linked to the age distribution in a few cases is the linkage to the physician’s practice lifecycle. One in four physicians described how their panel populations are aging in tandem with them: “it’s primarily a geriatric base because of the time I’ve been in practice growing old with me. My patient panel was 10 years older than on average the rest of the clinic.” (R12) Of those commenting on the life cycle tendency however, three cautioned on the need to mitigate against it: “the only way to maintain a successful practice is to have a balance (of age) and sex as your patient profile. So a guy like me 30 years in practice: guess what I get better at geriatrics cause that’s what I’m doing more and more.” (R9) Just one physician, fairly early in his career, mentioned being proactive trying to keep a balanced patient profile: “I do all age ranges and deliberately you know try to ensure that (I) have babies always coming off the pipeline.” (R24)

### *Socio-economic status*

Next to the age distribution, some measure of socio-economic status (SES) was the most frequently mentioned panel descriptor, cited by more than half of the physicians. The most common term used to describe SES was some combination or range of lower, middle or upper-middle class. Most physicians who used SES as a descriptor referred to some mix in their practice in relation to income and/or occupation: “St. Albert tends to be kind of middle, upper-middle class...Morinville is actually quite a bit different. There’s probably a lower overall

income and socio-economic status out there” (R14); “from a socio-economic status, it’s a real mix out in our area we have from the wealthy rancher, oil and gas executive too, you know, people who are in town who are on welfare ... who are basically scraping by, employed or working in, you know minimum wage type jobs.” (R23) None of the physicians elaborated SES with regard to the educational distribution of their panel, although one mentioned that they had deans and faculty because the clinic had previously been located in a university.

### *Ethnic identity and religion*

Roughly one-third of the physicians cited ethnic identity or religion as a panel descriptor. The most frequently cited category was Aboriginal persons, followed by Hutterites. These groups of patients were cited mainly by physicians in rural PCNs with surrounding reservations and Hutterite colonies. One physician also cited some particular health issues with his Hutterite patients: “Hutterites they’ve got some unique health problems which are genetics and genetics issues within the colony.” (R15) Two specific ethnic groups that were mentioned were Japanese and Polish Canadians, both by physicians who spoke those languages, and one physician indicated that her services within the PCN were targeted toward immigrant women. In the context of citing these groups as descriptors of the practice population a few physicians noted their tendency to come in less frequently than other patients. With regard to the Hutterite colonies one physician offered the interesting observation: “I’ve never seen a Hutterite in a nursing home. They take care of their own.” (R15) As will be discussed further below there were a number of further references to the Aboriginal population when the topic of health inequalities was probed.

### *Disease profile*

Just over one-third of the physicians cited some aspect of the disease profile of their panel population. The most frequent mention was the prevalence of “chronic disease”, but there were also specific references to numbers of patients with particular conditions, such as “I’ve got (about) 135 diabetics” (R2) and “we’ve got some 550 patients on Coumadin” (R15). This is a reflection of the fact that all of the physicians’ interviewed were using an EMR and had been doing so for at least five to ten years.

### *Geographic locale and panel patients*

One third of the physicians described the general geographic location(s) from which their patients come: “most of them are Calgaryans, but some of them would be from some of the smaller communities around Calgary.” (R18) The distinction between a defined panel of patients versus a defined catchment population is fundamental to the proposals advanced by Kindig. Three of the physicians, all from rural PCNs, described their practice with reference to the population they are trying to serve: “we take care of an overall population of about somewhere between 60 and 70 thousand people.” (R10) As one of these physicians said later on in the interview: “a lot of people who move here say, well are you taking on new patients” and we all say: “if you live in Raymond, we’re taking on new patients...” if they’re local we consider that part of the non-contractual/ethical contract with the community.” (R6)

### *Gender*

Six physicians described the gender balance of their panel. All but one described having more female than male patients and one reported serving female patients exclusively. As one noted: “I have a lot of daughters of patients. So it’s pretty much women’s health focus. But I’ve

made a special effort over the years to acquire men. So I do have a nice little subset of men.”

(R16)

#### *Type of medical practice*

Five physicians described their practice with reference to the services they offered. These descriptions ranged from a comprehensive offering: “it’s basically cradle to grave kind of practice so I’ll look after newborns...I basically go through the entire spectrum including palliative care” (R2) to family practices that included specialized interests. Examples of these included “I have an interest in sports medicine. I have an interest in disability management” (R12), and “I have a big interest in pulmonary and cardiac disease and almost have a bit of an internist kind of way of approaching people as opposed to just family medicine.” (R18)

#### *Lifestyle*

Finally, two physicians described their panels with respect to the lifestyles of their patients. One described his panel in terms of “both ends of the spectrum...you see the very healthy, look after themselves, slim, trim, active non-smoking type of individuals. But there are certainly a reasonably significant percentage of the population that fall at the other end. They’re overweight, obese even. Sedentary lifestyle. They’re smoking, all of the usual lifestyle factors.” (R17)

In summary, in terms of the first objective, through their descriptions of their panels it is evident that the physicians were highly aware of the range of social determinants of health. It is particularly interesting that SES was the second most frequently mentioned descriptor after age. Although not directly comparable, this is in clear contrast to the research among the general population that shows SES well down the list of determinants of health.

### *Defining population health*

In order to address objective 1, the salience of population health, the physicians were asked in an open-ended fashion “what does the term ‘population health’ mean to you?” Most physicians provided fairly short answers of two or three sentences. Six dimensions emerged out of the responses, and the majority of physicians cited only one or two, with a few citing three. In descending order of the frequency with which they were mentioned, these are:

- Collective versus individual health - 8;
- Preventive orientation - 7;
- Being accountable for a panel - 6;
- The health of a population delineated by geography - 4;
- The health of a population delineated by a characteristic of demography or health status - 4; and
- The health of a population as a result of lifestyle and related determinants of health - 3.

Each of these dimensions was mentioned by several physicians.

### *Collective versus individual health*

One-third of the physicians provided some definition of population health in terms of a collective. Some of these definitions were very simple: “population health is really the big picture as it refers to in my eyes, it refers to society itself” (R2) and “it applies to looking at a group or a community of individuals as opposed to the specific needs of an individual.” (R15) One physician provided a detailed description of population health as the result of the collective efforts of numerous actors.

It takes a community to raise a child ... it takes a community to maintain the health of everybody. And so if population health is the result of the partnership of the client, patient. Of their doctor, of hospital and community health care providers such as home care. It’s another way of calling, public health ...

volunteer organizations such as Alzheimer Society, Diabetes Association. Cause education is a big part of this. The media is part of it. So my idea of population health is the maintenance of the best standards of health for everyone in the community. (R8)

#### *Preventive orientation*

Almost one-third of the physicians defined population health with reference to a preventive orientation in their practices, such as “it’s looking at broad-based screening programs to capture illnesses prior to them becoming problems” (R12) and “how do I manage my diabetics and my hypertensives in a way that meets their needs as a group”. (R7) The population perspective was echoed by another physician: “what can you apply to a whole population that really lends itself to prevention?” (R5).

#### *Being accountable for a panel*

Six physicians offered a definition with reference to their own panel: “mostly I would think of it more in the population ... my panel or practice population”. (R5) Moreover, three of them explicitly mentioned a sense of accountability or responsibility for their panel’s health such as: “being accountable that certain measurable targets are being met for your population.” (R4); and “the way I approach it is that I have a population of patients that I’m responsible for.” (R7)

#### *Delineation by geography*

Four physicians defined population health with respect to geography, and most of them did this by situating their panel in a broader context: “I think of it in two senses, one is you know like say Alberta or Edmonton or the neighbourhood. I also think of it in the sense of the population that I’m the primary care doctor (for).” (R5) One physician attributed her perspective to her work on provincial committees such as an advisory committee on cervical cancer screening: “so I tend to look at things beyond my practice, because I’m getting input coming as to what provincial guidelines will be.” (R18)

*Delineation by socio-demographic or health characteristic*

Four physicians defined population health with reference to a specific subset of the population delineated by either a socio-demographic or health characteristic: “it could be with the First Nations people, with the Hutterite people” (R13) or “you could look at women’s health” (R20) In terms of health characteristics, one physician mentioned: “is it inner city, where they have specific problems related to mental health issues and drug issues?” (R6)

*Delineation as a result of lifestyle*

Three physicians implicitly defined population health as the product of lifestyle and related determinants of health. One described as “a certain part of society anyway that looks at things like lifestyle, it looks at obesity, it looks at addiction abuse, smoking, exercise levels ...” (R2) Similarly, another physician said “population health ... I guess if you’re looking at my panel, I guess you would look at certain measures such as smoking, blood pressure, cholesterol ...” (R14)

Interestingly, two of the definitions contained an aspirational definition of the level of health. As one physician put it: “just trying to achieve as best health and quality of life in a given practice population”. (R3)

In summary, all physicians identified population health with respect to some sort of defined aggregate of patients. Given the frequency of mentions of prevention in these definitions there seems to be an implied dimension of striving to enhance the health of that aggregate. One physician in particular emphasized the advocacy role that physicians can play at the level of the community, over and above his role in caring for his panel: “at the same time also see what can you do to even actually further their health status ... like fluoride in the water ... you should and

must play an active role, as I did in the fluoride case ... but was on the losing side ... so not necessarily one by one interactions but on a program wide or system wide level.” (R24)

CHAPTER 4.  
THE DETERMINANTS OF HEALTH AND THE CONTRIBUTION OF  
THE FAMILY PHYSICIAN

In order to address objective 1 with respect to the determinants of the health of the panel and surrounding community, the physicians were asked about determinants in an open-ended fashion as well as their opportunities to contribute to their panel's health in their role as primary care physicians.

***Determinants***

When asked about the determinants of their panels' health, the physicians provided a rich array of determinants and a number of illustrations. Fifteen determinants were mentioned at least four times. Almost half of the physicians listed at least five determinants with nine being the highest number recorded. One physician listed only one determinant, but all others mentioned at least three. In descending order of frequency of mentions the determinants cited were as follows:

Socio-economic status - 14	Family status - 6
Education - 11	Obesity - 5
Smoking - 9	Employment status - 5
Access and utilization of health care - 9	Culture - 4
Exercise - 7	Stress - 4
Diet and nutrition - 7	Addiction - 4
Chronic disease - 6	Housing - 4
Psycho-social issues and mental health - 6	

In addition to these 15 there were unique mentions of gender, the environment and sewer and water. The only two of PHAC's list of 12 determinants that were not cited in the specific answers to this question were biology and genetic endowment, and gender.

Of these 15 dimensions only three would be considered to be of a medical or health-related nature: access and utilization, chronic disease and psycho-social and mental health issues. As one physician prefaced his answer, "well interestingly enough, a lot of them are not medical." (R15)

#### *Socio-economic status*

Socio-economic status was the most frequently cited determinant, by more than one in two physicians. This reinforces the finding that SES was the second most frequently mentioned descriptor of the panel population. In most cases, the physicians simply reported "socio-economic status" without further elaboration and there were a few references to "class" and income and occupation. As one physician described in greater detail: "the biggest one I think is their socio-economic status ... in the population we serve a lot of them work, two jobs, two income families, one income goes and they're in trouble. They're often one pay-cheque away from financial difficulty." (R21) A few physicians linked socio-economic status to other determinants such as "smoking tends to be higher in lower socio-economic status" (R14) and "lower income creates stresses that make anxiety and depression." (R4) Income was cited by physicians as both a barrier and an enabler to access to medications: "a lot of them (panel patients) are immigrants and they're you know still establishing themselves so finances tend to be an issue ... lot of them don't have coverage for their medications." (R20) Conversely one physician noted, "I'm thrilled that virtually every single one of my patients has great drug insurance and great auxiliary health insurance." (R24)

### *Education*

Level of education was the next most frequently cited determinant, by almost one in two physicians. There was generally no elaboration beyond the mention of education, beyond short phrases such as “get a good education” (R8) although there were two mentions of literacy in the context of education.

### *Smoking*

More than one in three physicians cited smoking as a determinant, and one went further to elaborate on the declining prevalence saying that “smokers in any doctor’s practice are getting small and smaller. You’re seeing then in the tail end of their careers where they’re the chronic COPDs (patients with chronic obstructive pulmonary disease).” (R6)

### *Access and utilization of care*

More than one in three physicians cited access to, and utilization of, health care as a determinant. Six of these nine physicians cited it as a positive determinant of health. Prevention screening was cited by two of these physicians as “being very proactive in knowing what the clinical practice guidelines are for the maintenance of health” (R8) and “access to primary care would be a determining role in terms of getting routine screening done.” (R14) At the same time three physicians cited a higher frequency of visits to their doctor or hospital in answer to this question as a predictor of poorer health. This was very explicit in one response: “How many visits they have in a year. It’s a pretty good marker. So the ones who see me once every 18 months or 2 years are pretty healthy. They’re pretty comfortable with their health and they manage it ... and the ones who see me every other month are obviously struggling.” (R16)

### *Exercise*

Exercise was cited as a determinant by almost one in three physicians. As one lamented, “I rue the day that they took phys-ed out of the school system.” (R15)

### *Diet and nutrition*

Diet and nutrition were also cited by almost one in three physicians. This was mentioned in both a positive and negative context. The positive context was “if you can get people to eat properly” (R21) while the negative context related to an access issue: “how can people be healthy if they don’t get the right type of foods” (R8), as well as excess, “too much eating.” (R17)

### *Chronic disease*

One in four physicians cited the prevalence of chronic disease as a determinant of health. Four of these physicians simply mentioned “chronic disease”, while two mentioned specific chronic diseases. These responses were “hypertension, diabetes, heart disease” (R6) and “poorly controlled diabetes.” (R10)

### *Psycho-social issues and mental health*

Mental health, also referred to as psycho-social issues, emotional health and depression, was cited as a determinant by one in four physicians. Two physicians linked mental health to lifestyle determinants as a consequence, for example “probably like most family practices, psycho-social issues play a significant role, and those secondarily would translate into some of the lifestyle factors.” (R17)

### *Family status*

One in four physicians cited marital and family status issues as a determinant. One in particular specifically outlined the social support role of the family: “like if they’re getting older and you know they don’t have strong family connections.” (R5) Two physicians cited lone parent-families, “I don’t know what the term would be, but their family home status. Is it a broken family, is it divorced?” (R13)

### *Obesity*

Obesity or weight was mentioned by five physicians, most generally without further elaboration, although one physician linked it to diabetes management.

### *Employment status*

Employment issues were mentioned by five physicians, both in the positive context of having a job and in the negative context of either stressful or lost employment. On the positive side: “most of my patients are either on a track to some sort of defined vocation, or are in an educated vocation.” (R24) On the negative side, one physician described the situation of oil rig workers who lost their jobs and began to gamble heavily to try to make up for losses. Another suggested that “the level of stress in the workplace is certainly a big issue.” (R18)

### *Culture*

Four physicians cited some aspect of culture as a determinant of health. Two of them cited culture in the context of immigrants. For example, “cultural beliefs, so I think that’s another big determinant, so often times the woman are very uncomfortable seeing male doctors for women’s health issues.” (R20) The other physicians citing culture referred to “what their belief system is as far as the value of their health” (R18) and “social mores, beliefs that comes out of cultural stuff.” (R19)

### *Stress*

Stress was mentioned by four physicians. Three of these physicians linked it to employment issues such as job loss, “working 14, 16 hours a day” (R17) or a stressful workplace and one of those also cited the family situation.

### *Addiction*

Addiction issues were cited by four physicians. Two of them specifically mentioned drugs and alcohol, and one mentioned addiction in the context of “a chaotic lifestyle where they can’t pay attention to their diabetes because they’re being abused or they’re addicted to something like that” (R4)

### *Housing*

Housing was mentioned by four physicians, with references such as “having a roof over your head” and “proper housing.” (R18), (R22)

While answering the question about determinants of health two physicians referenced the Aboriginal population, linking it to other social determinants, “when I think about our First Nations people I think about what’s your housing situation,” (R13) and “with the Aboriginal group there’s a lot of social determinants.” (R15)

In summary, of the more than 100 mentions of determinants of health, just one fifth could be categorized as related to medical and health care issues; indeed access to medical and health care represented only one-tenth of all the mentions. One-quarter of the responses referred either to SES or to education. One-third could be classified as lifestyle (e.g. smoking, exercise), and roughly one-fifth could be classified as social support or social environment.

### *Contribution of the Primary Care Physician to Panel Health*

When the physicians were asked in an open-ended manner how best they contribute to the health of their panels, six key dimensions emerged. In descending order of the frequency with which they were mentioned these are:

- Preventive screening - 14;
- Lifestyle counseling - 12;
- Patient-physician relationship and continuity of care - 10;
- Chronic disease management - 8;
- Gatekeeper - 7; and
- Access to acute care - 5.

Just under one in two physicians cited one or two of these dimensions, while a similar number cited three. Just two physicians cited four and five dimensions, respectively.

#### *Preventive screening*

The role of the physician in preventive screening was the most frequently cited dimension, by more than half of the physicians: “first of all, you want to make sure that you’re screening your patients to identify disease early” (R1) and “I see myself as a guardian of their preventative care as far as screening anyway.” (R2) Five of these physicians described playing a more “pro-active” or aggressive role in systematically screening their panels. As one physician noted: “we’ve actually made effort(s) to contact 100% of my patients and offer them screening. And so we have now 94% of my patient population with mammograms. Even though 100% were asked.” (R7) Aside from outreach another physician described a “proactive office encounter”, as “a strategy where you kind of try and take care of business, when a patient shows up on your doorstep, regardless of the reason. So they may be coming in for a sprained ankle or a, you know

relatively trivial complaint or concern, but you have a team and a process in place that determines if they require a screening.” (R10) Another physician related a story of a patient who came in with a sore ear. Noting the patient’s history with a colorectal polyp he was sent for a stool test that came back positive and the patient’s colon cancer was successfully treated. As the physician summarized it: “if we’d waited two more years and he’d had a colonoscopy, it probably would have spread by now. So being able to be proactive and get ahead of the disease is the whole goal.” (R8) One of those physicians linked proactive screening to a group treatment strategy: “The key is case finding. Getting a group of people together with a common problem and then being able to deal with them in bigger groups.” (R21)

#### *Lifestyle counseling*

One in two physicians cited their role in lifestyle counseling. Smoking cessation was the most frequently mentioned specific example. Several physicians elaborated their role with respect to their being perceived as an authority figure and as a resource. As one noted: “I think that a primary care physician is probably the most powerful in addressing bad habits and determinant of health such as encouraging (patients) to have good weight, not to smoke, mental health issues.” (R2)

Another of these physicians talked about how his practice set an example for the community: “you know indirectly we try to promote an active lifestyle. We recently sponsored the 10k run here which is actually named after a deceased physician ... a race we have every July 1<sup>st</sup>, we had 240 runners this year.” (R6)

#### *Patient-physician relationship and continuity of care*

Almost one in two physicians described promoting their panel’s health by establishing a patient-physician relationship and/or providing continuity of care. In describing the importance

of a relationship, one physician noted the limitations on practice size: “how many can you recognize, know their names, because when you go beyond that, I think my ability to have an impact with me or my team (will) have for less impact if we don’t have a personal relationship.”

(R4) Three physicians described the relationship in terms of a group visit, something that was also mentioned in answers to other questions by several physicians: “in my practice we do what we call group medical business ... you can get a whole bunch about 10 to 15 people and spend an hour and a half. An hour and a half of interaction. While we do individual checks on different things ... traditional one to one, 5-10 minutes of an office visit and you’re not getting much education.” (R11) Two physicians explicitly mentioned the term continuity of care: “the part of family practice that I enjoy is the continuity of care ... the extended health care surveillance and trying to help people through the full spectrum of emotional problems and how they tie in to their general health.” (R12) One physician provided a compelling story that linked together lifestyle, the patient-physician relationship and continuity of care. “When I see the patient I sort of have this sense that behind them there’s this horizon of like a movie ... I can almost see in general how their future health is playing out ... and I try to help build their insight into where things are going unless things change.” (R24)

#### *Chronic disease management*

One in three physicians mentioned their role in managing chronic disease: “so we’re managing you know the commonly named ones, the hypertension, diabetes ... trying to keep them stable and functional and in the community and keeping them away from crisis into the emergency department.” (R5)

### *Gatekeeper*

Seven physicians described a gatekeeper role or coordinator of access to other resources, either through referral or within their PCN. In particular one physician cited the role of the PCN in enhancing this role: “the primary care network landscape contributed way more now than we ever did before, by knowledge of and linking to social and medical supports that we maybe didn’t have knowledge before in an integrated fashion.” (R19) This role was best described by one physician who referred to herself as “the conductor”. “So some things I do. Some things I refer on – but I’m the conductor. Everything comes back to me – I can’t play all the instruments ... some of my patients need specialist care, but I can still kind of know what’s going on.” (R1)

### *Access to acute care*

Five physicians described their role in the more traditional fashion of being accessible to provide acute treatment: “so one of the things I’d say is accessibility. We work at that. In a small community, if we don’t (see) them they go to the ER ... if you say you’re sick, we see you today. No matter what it takes.” (R6) Two of these physicians specifically mentioned their role in keeping their patients out of hospital. As one put it: “really a lot of it is keeping people in the community and keeping them out of the hospital” (R5)

One physician who had held leadership positions in organized medicine acknowledged his limitations in directly addressing non-medical determinants of health, “I don’t think doctors have as direct an influence on things like ... housing and transportation.” However he did emphasize an indirect role as an advocate; “on a one-to-one basis we advocate for people who are applying for social services, apply for income support, disability, pensions and I think elected officials will tend to listen to doctors if doctors do speak up and advocate.” (R5)

In summary, the physicians recognized that they play several roles in contributing to the health of their panels. In terms of the frequency of mentions, those on the “upstream” side such as preventive screening and lifestyle counseling outnumber mentions of what might be considered the more traditional roles of gatekeeping and providing acute care. As they described it the physicians clearly saw their role as more on the “upstream” side of population health, although as will be discussed further below there is a challenge of balance. They also acknowledged that there is a significant burden of chronic disease.

CHAPTER 5.  
TYPES AND CAUSES OF HEALTH INEQUALITIES AND WHAT PRIMARY CARE  
PHYSICIANS CAN DO TO MITIGATE THEIR EFFECTS

*Types and Causes of Health Inequalities*

In order to address objective 1.2, the physicians were asked about health inequalities (i.e., subgroups of patients whose health they would consider below the norm) in their practices, the underlying causes of them and the role they as primary care physicians might play in reducing them. Seven types of inequalities were identified. In descending order of the frequency with which they were cited they are:

- Aboriginal patients - 7;
- Patients with low socio-economic status - 7;
- Elderly patients - 6;
- Young patients - 4;
- New immigrants - 3;
- Single parent families - 3; and
- Patients with specific health problems - 2.

More than half of the physicians identified only one type of health inequality. Five physicians cited two types and two physicians cited three and four types. Only one physician reported that his practice did not really have health inequalities: “we’re pretty homogeneous... there’s no subgroup that you could say has an inferior level of health. You could say we have a subgroup that’s Hutterites. But their level of health isn’t inferior.” (R6)

*Aboriginal patients*

In a majority of cases the physician also mentioned the underlying cause of the health inequalities. One in four physicians cited poorer health of their Aboriginal patients and offered several reasons for this. The most frequently cited reason was their infrequency in seeking medical attention. As one physician noted: “I have a great concern with the Native population, because they will come here and you will do your best to be proactive. But their attendance is helter-skelter. It is more when they’re in crisis”. (R8) Providing a very specific example, one physician noted: “I have one (Aboriginal patient) right now with a very bad ulceration of his leg, who just doesn’t like taking pills. Doesn’t like to check on his diabetes. The end result, guess what, you end up in hospital”. (R11) Cost was cited as an access issue among Aboriginal patients: “they have financial concerns, there are issues with their pharmaceutical coverage, tends to be restricted in certain things that are of potential benefit to their care. And they won’t buy them if they have to pay for them”. (R12) Geographical distance was also mentioned as a barrier to access: “I have seniors in the Aboriginal community that pay exorbitant fees to have a nephew drive them in.” (R12) Several physicians cited social factors as a cause of health inequalities among their Aboriginal patients: “I think as a socio-economic group... what is interfering with their ability to maintain good health care is, family troubles, family crises, all due to poverty, poor housing and violence.” (R8) Lifestyle was also cited as a factor: “there’s a higher incidence of diabetes, obesity, smoking.” (R14)

One physician contrasted his experience in working in two Aboriginal communities, one being a reserve and the other not, and attributed the difference to sense of responsibility. “The biggest reason for the poverty in the reserve group near my practice is that the community, the

individuals are devoid of any responsibility...as a result you get a certain chunk of the population that acts like they're 17 their entire lives where every day is a party. And as a result you get family dysfunction and the substance abuse". (R17) In contrast he said: "in my Native population which is about the same size when I was in northern Alberta, where it wasn't a reserve, about 80% of the men were employed. They had to be a lot more responsible when it came to avoiding the substance abuse and they did a much better job of raising their children." (R17)

#### *Patients with low socio-economic status*

One in four physicians equated health inequalities among patients with lower SES. A variety of underlying reasons were put forward: "the challenge is always the population that falls into the lower socio-economic group, where compliance is an issue." (R2) Another physician noted: "I think often the lifestyle issues tend to be much more significant in that (lower SES) population ... the smokers and their weight gain and I guess in terms of the types of diets ... and inactive." (R17) Physicians also saw time and finances as a barrier to seeking care among patients with lower SES. In terms of time, one physician noted: "you've got subgroups, like as I said the working poor. Those groups need to be dealt with somehow differently than the guy who is working in an office who can take time off and who is educated, and who will you know probably follow through a little bit better." (R21) In terms of finances, access to pharmaceuticals was cited by one physician: "I found if people are in jobs that don't have health insurance and they're not making the greatest money from their jobs that's just hard clinical medicine ... you know then it's because sometimes people just need certain medications." (R24) Two physicians mentioned mental health issues in association with lower SES.

### *Elderly patients*

One in four physicians cited health inequalities among their elderly patients and the majority of these mentioned lack of social support as an underlying issue:

The ones I worry about the most are the elderly without family support ... they tend to fall through the cracks in terms of you know you watch, you start to worry about how's their nutrition, what's their safety, you know are they monitoring and managing their own illnesses right? ... and sometimes by the time you get homecare or other agencies involved like that, it's declined more than you realize. (R5)

Income was also cited as an issue among elderly patients by one physician.

### *Young patients*

At the other end of the age spectrum four physicians cited health inequalities among their younger patients. Two of them cited their lower propensity to seek health care as the underlying issue: "...I'm concerned about adolescent health. Quite frankly they don't come until things are in crisis." (R4) One physician emphasized that this occurs mainly among younger men: "so talking about males between 18-35, who don't get blood pressures done ever, you know never come to the doctor, because basically unless they have injury, they don't see the need... but there are still some screening disease prevention things that might need to happen." (R10) One physician was mainly concerned about the fitness of his younger patients: "I could probably run circles around most of the 25 to 30 year-old males that are in my practice. The level of overall physical fitness and the amount of obesity, the amount of you know the sedentary lifestyles stuff is really quite alarming". (R15) The other physician reporting health inequalities among youth cited "these young teen pregnancies" and associated them with (lack of) social support, low education and smoking. (R20)

*New immigrants*

Three physicians cited health inequalities among new immigrants. One of them observed that “the new immigrant population comes with a huge burden of mental health issues.” (R7)

*Single parent families*

Issues of single parent families were cited by three physicians: “and we’ll see some form of a history of a broken family type thing, either they’re the child in a single parent family or they’re one of the parents.” (R13) Single parenthood was also associated with difficulties in accessing care: “for people like single moms, you need to realize that they need to be seen in their area. They can’t travel with two small kids. You need to sort of deal with the issues of the children. Who’s going to look after them, so they’re (mothers) not distracted while you’re talking to them.” (R16)

*Patients with specific health problems*

Finally, two physicians mentioned groups of patients with specific health conditions and lifestyle was cited in both cases. Diabetes was one such group: “some diabetics that are not as well managed as I’d like. And what characterizes then I think is lack of commitment to life-style modification.” (R1) The other condition cited was smoking related illness, “people smoke for a number of years. And the COPD population has significant health issues.” (R3)

In summary, the types of inequalities reported were similar to the determinants of health. One difference, however, is the role of lack of social support, which was mentioned in the context of elderly patients and single mothers.

### ***Physician Role in Mitigating the Effects of Health Inequalities***

The second element of objective 1.2 was to probe the role that primary care physicians might play in reducing health inequalities. When asked what role they might play in reducing health inequalities, two out of three physicians described at least one approach. Among the remainder, the majority did not offer comment, although one physician lamented that there were people who were underserved but that her practice was at capacity: "... our practices are closed. So we would love to be able to offer this excellent health care to everybody. But we just can't." (R8)

The physicians identified five strategies for mitigating health inequalities. In descending order of frequency with which they were cited, these were:

- Collaborative team approaches - 7;
- Patient education - 5;
- Outreach to patients - 3;
- Role modeling - 2; and
- Physician advocacy - 1.

The first three of these strategies were mentioned by at least three physicians.

#### *Collaborative team approaches*

The most frequently cited strategy was the collaboration and involvement of other team members, by almost one in three physicians. Three of the physicians mentioning the health team did so in the context of addressing mental health issues. As one physician noted: "if we were to kind of close the gap between the family physician area and that of social work, mental health, home care area ... and move them into the collaborative team then I think we could probably improve some of these differences and inequalities." (R13) Another physician described how his

practice had specifically trained someone to assist with immigrants who did not speak English: “So we hired a gal, what we call a coach. She’s not formally trained medically. So we’ve just sort of trained her up in the resources of the community . . . will come into the office with me when I see them, and she’s an interpreter, but she will then stay after I leave the office and say did you understand what he was talking about or can you afford these pills”. (R7) Another physician reported the value of other team members in reinforcing her advice: “well sometimes using team members has been helpful. Just a different voice. Same message but a different voice, sometimes helps.” (R1)

#### *Patient education*

Just under one in four physicians cited some aspect of patient education with an emphasis on trying to convey information appropriate to the patient’s level health literacy. As one of those physicians reported: “I think that they need to be dealt with on a level that they can understand. Take their educational level. I think we often talk way above the patient, you’ve got to say okay, what is it that you need to know, and start at that level rather than coming at them with a set agenda, which we often do.” (R21) One physician linked health literacy to team collaboration, “how do you help with health literacy, that’s tough. Because that takes time. And so that’s where the team collaboration (comes in).” (R23)

#### *Outreach to patients*

Three physicians suggested that the ability to do outreach in the community would enable them to address health inequalities. Two of these cited the role of technology: “so now what we’re doing with some of the Native population is telehealth, saying well if they can’t come to us, then we’ll go to them, or connect electronically anyway for some of these different things.” (R11) One physician suggested that public health nurses could take on such an outreach role; “so

my proposal would be why can't we help find the unattached patient in their workplace, maybe in the mall on Saturday ... and repurpose public health nurses to do that kind of work." (R10) This physician went further to extend the outreach approach in the "proactive office encounter" and indicated that he planned to hire a Proactive Office Encounter Tech (POET) to perform screening activities. The proactive office encounter is a term adopted by Kaiser Permanente in the United States that combines information technology and workflow design to improve preventive care and chronic disease management. This physician had evidently coined the POET term himself since it does not appear in the Kaiser literature.<sup>223</sup>

One physician described an attempt to identify patients at risk of high utilization: "we did one piece about frequent fliers. We had data on people who were using the emerg 15 to 20 times a year, using different places. And we looked at it and said, okay can we approach these people in different ways. Are they attached (to a family physician)? Do they have additional resources to deal with the complexity we see generated by the frequent visits?" (R9) He went on to note, however that the data that were provided to them were two years out of date and that it was not a success: "but we need it in real time."

### *Role modeling*

Two physicians cited role modeling as an approach to mitigating health inequalities among youth. One suggested that the physician can be an effective role model: "first of all you can show a good example yourself. You know if people see you doing the right things, perhaps they will be inspired to do some of the right things themselves." (R15) The other physician suggested the need for role models to encourage Aboriginal youth to stay in school: "some of the young people I try to encourage them to get into school, and do something with themselves ... so

there's a lack of role models out there." (R22) He also acknowledged the efforts that teachers make in this area.

### *Physician advocacy*

One physician described his role as an advocate in helping low income patients to obtain medications. "So if somebody's asthmatic ... and they need puffers but they can't afford the \$200 a month ... you try to pester the drug reps to give you more samples or you call the company and try to get them on a special authorization for a year of free samples that sort of thing." (R24) Further in this regard, he also described his role in counseling patients on other aspects of their lives with health implications, such as family life: "as your doctor, I'm worried if you don't have a formal separation agreement with your husband ... I've had many patients who haven't had a formal separation agreement with their husband and things started off amicably but a year later they're not ... and then the impacts on somebody's health are quite profound." (R24) He provided other examples such as linking young adults with career counseling services.

In summary, although reporting on inequalities was much less extensive than reporting on determinants of health physicians were clearly aware of groups at risk among their patient populations. Reporting on what physicians can do to mitigate the effects of these inequalities was even less extensive and the most frequently reported strategy was through the engagement of other team members. Just one physician described his role as a health advocate to secure medications for patients who cannot afford them.

## CHAPTER 6.

### THE BALANCE BETWEEN PREVENTION AND TREATMENT

Objective 2 was to assess how physicians perceived the balance between preventive and acute treatment activities and the issues associated with achieving a desirable balance. The physicians were asked to describe the balance between health promotion/disease prevention and the treatment of acute/chronic illness activities in their practices, and to further comment on the appropriateness of the balance. For the most part, the physicians provided a detailed description of the balance that goes deeper than McKinlay's 1974 upstream-downstream conception that simply distinguished between interventions with a preventive focus and interventions with a curative focus.<sup>27</sup> Many of the physicians divided their activities into prevention, treatment of acute illnesses and chronic disease management. Prevention activities were further discussed in terms of screening activities and giving advice to patients.

More than half of the physicians offered an explicit assessment of the balance of prevention versus treatment in their practices, and just over one in four mentioned chronic disease management. Among the six physicians who estimated a quantitative balance of prevention versus treatment, it was evident that the treatment of acute and chronic illness still dominated their medical practice. As one physician noted: "And roughly I said, 20% of my practice would be primary prevention, I'd say another 20% would be acute medical illness, the sore head, the sore neck. And then I'd say 60% of my practice would be chronic disease management." (R13) Another physician reported: "A vast majority is putting out the fires and doing the treatment of illness and probably less than 25% would be the preventative type stuff." (R15) One physician answered the question from the perspective of the whole Alberta health system, noting that "we spend maybe 5% on prevention and promotion." (R18) One physician

noted that, “we’ve shifted way over to the, at least I have in this practice a lot more on trying to prevent things, as opposed to treating them acutely.” (R21)

Notwithstanding the tendency of the physicians to report a significant balance in favour of treatment over prevention, four out of five physicians did describe their role in prevention as either one or both of screening and counseling patients.

More than one in two physicians described their role in counseling patients how to maintain or improve their health, either by themselves or by members of a multidisciplinary team. As one physician reported:

... The success depends on follow-up. And the follow-up is reminders, re-visits, you know just giving the patient the support to actually go through with changes they might want to do in their lives. And I probably don’t have enough time to do that, but that is really where alternate providers, nurses (come in) ... they can do telephone follow-up you know see how it’s going. Do you want to come back in, let’s weigh you again and how are you doing with your smoking. (R2)

Several of these physicians emphasized the importance of engaging patients in the context of counseling. For example: “you know really what you want to do is activate patients. Help them to be more in control of their health” (R11) and “you might need to see him for interpretation. But you know activating a patient, helping them become the ones primarily responsible for their health is the way to go. (R11)

A few physicians mentioned taking advantage of acute care visits to provide counseling: “... so they’ll come in with their problem, and then along with that you can squeeze in some education, some prevention ...” (R20) One physician felt that group visits would help to increase the role of prevention and bring in patients who might not otherwise present based on the experience of a pilot: “I did a pilot project with the shared mental health care, people on wellness ... I invited 10-15 ladies to come and we got 8 ... it wasn’t true prevention in our disease system

approach, but it was mindfulness and assertiveness ... lot of the things the women in particular need to know.” (R19) One physician noted that lack of time is a barrier in providing prevention counseling. “Sometimes time constraints are the big issue there, but I try and kind of bring it, (prevention) in, you see a lot of people come in with sore back or sore knee or sore ankle and it’s always an opportunity to talk about their weight, because it plays a role in the presenting problem.” (R15) While physicians tended to view prevention as an adjunct to acute care visits one physician described her proactive approach: “I like to talk about wellness on the positive side of the coin. A part of that’s prevention, it’s staying out of trouble and having a good diet, exercise, good supportive people around you ... and people who come to my practice know because I talk about it all the time.” (R18)

Looking ahead, one physician cited the potential for the EMR and the multidisciplinary team to empower patients and mitigate the problem of lack of time. “What you want to do is activate patients. Help them to become more in control of their health ... the team approach is big ... advanced electronic access is going to be big helping them (patients) get their information without the bottleneck of actually seeing the doctor ... you might need to see him (the doctor) for interpretation.” (R11)

Almost one in two physicians described their role in preventive screening activities and several of them cited one or more of the periodic health examination (PHE), the EMR, or team members in facilitating these activities. In terms of the PHE, one physician reported, “like a lot of docs, I use the periodic medical or the annual check-up. I usually ask about smoking, seat belt use, bike helmets with kids.” (R5) This physician went on to describe an outreach approach to screening for disease against guidelines by employing a “screener”. “And she actually goes through my panel and looks and sees, okay we’ve identified this number of C’s patients as

diabetics. When's the last time they had the appropriate blood work done. Or look at the number of females over 40 in his practice, when was her last mammogram done." (R5)

In addition to facilitating screening against guidelines, the role of the EMR in assisting the face-to-face encounter was mentioned. "Because if you structure the electronic medical record in such a way that those things are staring you in the face ... you know if a patient's a smoker you have some notification or some visual trigger that says you're a smoker every time you open that account." (R17)

One physician described the value of the EMR in tracking screening performance. "When I look at some of the work we've done, with measuring delivery, of prevention like how many people get their blood pressure done, how many get, screened for sugar according to guidelines ... we've taken on projects that have typically increased our percentage of screening success by at least 20%. So we've batting in the 80 or 90% across most of the published guidelines." (R4)

In terms of the value of other team members in screening activities, one physician described the experience of a colleague who felt she was doing well with mammography screening. When she measured her rate it was 60% (of eligible candidates) which was better than average but still disappointing. "Then she got her nurse trying to do it and got it up to about 85%. And finally they put it to their receptionist to go through files and find out who hasn't had mammograms ... and they got her practice up to about 95%." (R5)

One physician made critical observations about mobile mammography screening. "There's a mammogram on a bus. So it can go to rural communities to make it easier for women to get mammograms ... so when we target one test or one population, sometimes we give them a false sense of security that they're getting everything they need and maybe they're not ... they don't check them for diabetes, they don't do blood pressures, they don't do any follow-up." (R1)

Seven physicians each specifically mentioned the situation in their practices with respect to chronic disease or acute illnesses; of these, two mentioned both. Three of the physicians that described chronic disease emphasized how the PCN has enabled chronic disease management through a collaborative practice approach. As one reported: “there’s no question that with our primary care network and getting into PCNs we’ve formalized the chronic care component in a way that I never would have imagined we would do. It’s monitored and formalized with the help of my nurse and things like this.” (R6) Another reported success in reducing health care utilization through a team approach involving a nurse and a respiratory therapist (RT) to manage asthmatic patients: “by putting in a case management through the nurse and self-management through the RT and the usual medical management, we dramatically dropped utilization of emergency department and hospitalizations.” (R7)

One physician noted that the bulk of his practice was chronic disease management and that it would be his preference to have this done by collaborative teams so that he could spend more time on acute illnesses and medical problems that he felt would be more appropriate for his expertise.

Among the physicians who specifically mentioned acute care, several acknowledged that while it continues to be an essential part of practice, there is a shift underway. This was best presented by a physician who said:

You know so I mean I was trained and practised most of my life in a reactive model, you know of doing acute illness, you know when the people crash and burn they come in and see you ... but over the last at least five years, in Alberta, and I think very strongly facilitated through PCN development ... we are moving upstream a little bit ... transitioning to more of the disease prevention role, because we have multidisciplinary teams. (R10)

A shift to chronic disease management was also cited: “even though probably we’re still thinking in terms of doing our usual acute management of heart failure and diabetes ... I think we’ll start to see more and more of the chronic care principles take over and decrease our acute management requirements.” (R7) Another perspective on acute care was put forward by one physician in terms of identifying high intensity patients. ”You still have to have that acute care, but we could do so much more if we really looked at who are the people that are frequent recurrent users ... why aren’t we doing what we need to be doing for these patients ... and that gets into all those complexities of the social determinants.” (R23) Similarly another physician described how fee-for-service payment with its implicit time constraint can be a barrier to prevention but went on to describe how Alberta has a supplementary payment for spending extra time with more complex patients and the potential value that this might have for upstream prevention. “Wow! In that extra ten minutes it meant then that you uncovered somebody who they were in for an ankle issue but you uncovered that they were starting to get depressed, that saves so much money for the health system.” (R19)

A few physicians noted the challenge of dealing with competing demands both in terms of groups and patients and problems for limited time and resources as a barrier to an upstream focus. As one noted: “But ethically I would say that you know probably we should be targeting health promotion among our disadvantaged groups ... but God forbid the high socio-economic citizen who drives their BMW can’t get in for their MRI of their wrist because some of our welfare recipients require some work-around.” (R13) Another added the difficulty in coming up with a “business case” for upstream prevention: “a dollar spent in the disadvantaged population recoups its reward tenfold compared to a dollar spent in the higher or mid socio-economic (population) ... we haven’t developed the issues or the ways to measure the needs of

disadvantaged groups ... so we can't do the financial modeling to show how supporting that group would in fact save money.” (R19)

In summary, the physicians clearly recognize the importance of prevention through counseling and screening activities and that these can be greatly facilitated by the EMR and other team members. Looking forward, chronic disease management will add a new dimension to the prevention versus acute care issue.

## CHAPTER 7.

### SUMMARIZING THE HEALTH STATUS OF THE PANEL POPULATION

Objective 2.2 was to examine barriers to deploying tools and strategies to promote population health in primary care practice. Looking forward the EMR and performance measurement indicators are key tools that are being promoted in Canada and internationally. The physicians were asked about their ability to summarize the health characteristics of their panels and what they thought about CIHI's core set of primary care performance indicators.

#### *Summarizing health status*

All of the physicians interviewed were using an EMR. Hence, all replied in the affirmative when asked if they could readily identify and summarize the health status characteristics of their panels, although there was a range in the breadth of experience with doing this. The majority of physicians provided a fairly detailed account of their practice's capability.

Aside from having an EMR, the physicians cited four Alberta program resources as supporting their ability in this area. First, Alberta maintains a diabetes registry that it populated with administrative data, using a case definition of either one hospitalization with an International Classification of Diseases code for diabetes mellitus or two physician billing claims with such a code.<sup>224</sup> The second resource cited was that aforementioned PDI program. The third resource cited was Alberta's Toward Optimized Practice (TOP) program that promotes evidence-based practice with clinical practice guidelines and other tools. One specific TOP program tool that was cited by one physician is a Periodic Health Exam Checklist that contains 10 prevention screening items with age-sex-specific guidelines.<sup>225</sup> The fourth resource cited was a Complex Care Plan that was implemented in 2009 and is a fee code that remunerates family physicians for taking extra time with complex patients to develop a mutually agreed upon care plan. "Complex"

is defined through a combination of chronic disease and other factors including mental health, obesity, addictions and tobacco.<sup>226</sup>

In describing how they used their EMRs to summarize the health of their populations five categories of activity were mentioned. In descending order of the frequency with which they were cited these were:

- Diagnosis and management of diabetes - 18;
- Diagnosis and management of hypertension - 9;
- Identification of candidates for prevention screening - 7; and
- Performing various analyses related to the management of the panel - 7.

In addition to being able to use their EMRs for these activities, four physicians described how EMRs facilitate multidisciplinary teamwork.

#### *Diagnosis and management of diabetes*

Given that the number of diabetics was mentioned as an example in the question it is not surprising that three out of four physicians mentioned either or both the number of diabetics in their practices and/or how they are monitoring their hemoglobin A1C levels. However, the diabetes registry was cited by several physicians. “We do have the diabetes registry, and we do have a list of patients now. It’s been a year or two since mine’s been updated, but we do have a means to identify that characteristic.” (R13) A few physicians described how they were able to use the EMR to help prevent their at-risk patients from becoming diabetic by proactively following them. As one reported, “we actually phone people and we have daily cards to follow them up. Not saying that everybody comes but I would say we’re probably 80, 90% of patients who fall in these categories and they have their blood work done ... and I think we’re at least keeping them stable, or if they go into the diabetic classification, at least we’re getting them on

medication earlier and to prevent complications as a result.” (R18) One physician described how he was able to query his EMR and compare himself to his peers in the management of diabetes: “I can actually ask specific questions, anything in my EMR like blood sugar greater than that. And I go by doctor, and doctors who work in the same clinic, with the same resources. They’re quite motivated to say, well how did you achieve better control than I did?” (R4)

#### *Diagnosis and management of hypertension*

One in three physicians mentioned either the number of patients with hypertension or the management of blood pressure: “we can pull out we can look at all our hypertensives, and see how many we’ve treated and how many haven’t been treated to target ... and call them in and be more aggressive that way.” (R23)

#### *Identification of candidates for preventive screening*

One in four physicians mentioned using the EMR to identify patients who meet the criteria for various preventive screening tests: “if you’re talking about our percentage with mammograms we can do that”. (R6) Also from a prevention perspective, four physicians mentioned having the ability to identify smokers: “cause at our EMR, and we’ve got software that we use that’s been quite helpful ... we could pull out the number of smokers.” (R23) At the same time an almost equal number of physicians reported that they did not yet have the ability to identify smokers. The availability of government-sponsored screening programs such as the Alberta Colorectal Cancer Screening Program was cited as a facilitator to prevention screening. As one physician noted: “our big push that we’ve entered into since a screening program became available a year ago with colorectal cancer screening”. (R6)

*Performing various analyses related to the management of the panel*

One in four physicians described how they were able to go beyond a review of basic characteristics in their panel populations to carry out more detailed analytical functions. Two of them mentioned the ability to identify patients at risk in the event of drug warnings: “I mean for example, if a drug gets pulled we can find all the people on that drug quite easily.” (R21) Two physicians mentioned a link between their EMRs and clinical practice guidelines. As one reported: “we have little icons that you know for certain chronic diseases, we click it and it brings up a table of their lab values ... and for some of them we can right-click and it brings up current clinical practice guidelines for that disease.” (R5) Another physician serving only female patients described how the EMR was used to identify the main reasons why patients were coming in: “so I think about a quarter were coming early prenatal care. Another big chunk I think was birth control, fertility concerns.” (R20) The EMR was also being used to monitor access: “we routinely review how long we keep patients waiting. And get a report per doc ... and we also look at continuity rates. And you’re seeing your own patients 85% of the time and you’re (different doctor) seeing them 90%.” (R4) One physician described how the EMR can facilitate benchmarking comparisons across PCN clinics and at the same time observing how challenging it is to do so without an EMR: “there’s 16 clinics in our PCN but many of those are not on electronic medical records. So they can’t get all of the measures and it’s about every 6 months that we’re able to compare ourselves with each other”. (R7) Aside from the frequent mentions of diabetes and hypertension there were a few mentions of identifying patients with other conditions including chronic obstructive pulmonary disease, congestive heart failure and asthma.

Four physicians cited the value of being able to share the EMR with other team members so that they can contribute to the record. As one noted:

We've moved into the world of what we call allied health professionals, the chronic disease nurse, the dietician, the anti-coagulation nurse, the mental health counselor, the kinesiologist, the pharmacist...I can send an e-mail to one of the members of the team and then they will have an interaction with the patient or group of patients and then they'll e-mail back and post notes to the file. (R5)

Another physician also noted the value of the EMR when team members are not co-located: "the chronic disease nurse can chart in the EMR even though she's not in the clinic. She may be down the road in another clinic". (R4)

In summary, based on the observations of these physicians the EMR holds huge potential for primary and secondary prevention and for population health management. It will also facilitate multi-disciplinary teamwork.

#### *Ability to capture primary care indicators*

The physicians were asked more specifically about their views of an abridged list of 30 primary health care indicators that CIHI distilled from its initial list of 105. The list of 30 is organized into nine dimensions (See Appendix A). It was pre-circulated to all participants and also shown to them during the interview. Half of the physicians provided a detailed commentary with regard to their own practice's capability and/or experiencing one or more of the dimensions. Among the remainder, they either had little comment (e.g. "yeah it might be" (R1)), or else they offered a general comment or commented on gaps in the CIHI indicators.

Among the physician providing specific commentaries on the CIHI indicators relative to their practice, the majority commented on one or two dimensions.

#### *Prevention and screening*

The dimensions most frequently commented on were those of:

- Comprehensive care, preventive health and chronic condition management; and
- Primary prevention and secondary prevention for chronic conditions (under Quality in PHC).

Four physicians cited the TOP Periodic Health Exam Checklist as an aid to prevention and screening and one mentioned the prospect of the PDI program. As one noted: “I’ve tried to follow TOPS for the last 10 years. Doesn’t always work but at least it’s in my computer so I can remind myself...and I think the nice thing about the 10 points is its not overwhelming. And I think of the 10 points I probably really actively look after 3 or 4 of them intensively”. (R16)

Clearly having an EMR is critical to capturing indicators. As one physician with more extensive EMR experience reported, “We have the ability to cut the cholesterol numbers. They’re actually easy to obtain either from a lab source digitally...they autopopulate into the templates...you can look at the lipid profiles so you can see...are you targeting your LDLs or whatever it is that happens to be the cause célèbre of the moment”. (R9)

The potential for prevention screening with the EMR to contribute to population health management and health outcomes and health outcomes was mentioned by one physician; “with our EMR we can create registries and work within those registries or panels and the hopefully improve their outcomes, meaning fewer visits to the emergency room, fewer admissions to hospital. And then the real thing is...better perception of health by the individual patient”. (R8)

A few physicians questioned the key preventative and screening indicators: “we focus a lot on diabetes and all of the cardiovascular sorts of risk factors. But again some people might argue depending on your practice population, maybe you do injury prevention you know which we look at the 20 to 45 age group. That’s probably one of the biggest areas of (mortality and morbidity).” (R17)

One physician critiqued the indicators for not providing a holistic picture of

the patient: “it would be really cool, if there was some measure of treating the whole patient, but I don’t know how you do it ... there’s access and process still here, the clinical things, or system based and not enough on mood, psychiatry and something around the whole person.” (R19)

### *Access*

The next most frequently discussed indicators were those related to access:

- Access to PHC through a regular provider; and
- 24/7 access to PHC.

Seven physicians discussed the access indicators. A commonly cited challenge was identifying access difficulties, particularly for the population without a regular family physician: “they say in Alberta that 20% of the population of adults does not have a family physician. So how granted some of those people are you know 18 and in the peak of health, so it’s not a crisis for everybody but there are people who really need a primary health care provider so access should be a huge focus.” (R8)

The issue of patients seeking care in other places was also cited as a challenge to measuring access difficulties: “I don’t really have a really good idea where they go if they don’t see me. Probably not so much access in my case, but it might be where they are...whether they’re working in Fort McMurray or they live on the other side of town”. (R2) While it is common to think of access difficulties in terms of time delay, one physician noted transportation and parking as an issue. “I could tell you for each doc how long does it take to get in. But there are other things that might mean that (access difficulties) like transportation. Like some of my patients were not located near where they live or work. So does parking create a problem? And the answer I can tell you right now is yes; because we’re right on the campus of a hospital”. (R4)

In terms of access for their own patients, one physician cited the access tools of the AIM project: “And so you can use the EMR to measure things like time to the third next available appointment...so the EMR, together with some of the tools from the Alberta AIM project has been very helpful in trying to solve some of those difficulties with access”. (R5) Two physicians mentioned 24/7 access and both noted the availability of the Health link tele-triage telephone line.

#### *Safety and outcomes*

Four physicians commented on the patient safety and treatment goals and outcomes indicators. With regard to medication alerts, one physician noted: “when we write prescriptions with our electronic medical record at the present time, a screen will come up, see what the allergies are and so it’s very, very difficult using our EMR to write (a prescription for) a medication that they’re allergic to.” (R8) In terms of treatment goals and outcomes indicators, one physician said that he was not familiar with ambulatory care sensitive conditions and one challenged the indicator for glycemic control for diabetes: “I wouldn’t put (that indicator) on there at all...I don’t see any evidence behind glycemic control for diabetes”. (R14) With regard to blood pressure control of hypertension one physician provided an excellent example of applying the EMR proactively. Describing a colleague in his practice he said:

He found that 50% of his hypertensive patients were smokers. So he had started to say, well have I offered them smoking cessation, so here’s where he started in September 09. And he started offering smoking cessation programs to his patients. So within 3 months he had moved from less than 20% to 50% of his patients. So he figured out who they were; and began involving the chronic disease management nurses and others within the practice. (R9)

#### *Continuity through integration and coordination*

Two physicians commented on this topic, which included a single indicator about collaborative care. One physician from a smaller city reported a challenge in making specialist

referrals: “if I need a specialist in neuropathies of the left toe or something, I don’t know where to look, I’m pretty well lost when it comes to that...so collaborative care means having a specialist that I can refer to who would see my patients in a timely manner, like this century”.

(R8)

### *Inputs and supports*

One physician spoke in detail about the issue of primary care infrastructure. On the issue of the interdisciplinary team he noted that: “the ratio right now for a nurse or a PCN to a family physician is a .2 position that supports a family doc, which I think by far not enough”. In terms of physical infrastructure he emphasized the need for space to promote team practice. “I think we need different kinds of facilities for family physicians. The two exam rooms doesn’t cut it anymore. We need conference rooms, meeting rooms, rooms for group practice”. (R2)

### *Patient access to health information*

Two physicians identified patients having access to their own health information and being able to act on it as an important gap in the indicators. As one of them noted:

The only thing I don’t see here yet is that kind of patient access to their information. If you have that list of things that should be done each year and the patient can access it themselves, it’s kind of like saying you know you haven’t had your monthly check on your car...more and more you don’t need the doctor for that, you just need, you know, a good set of guidelines and patients’ access to them. (R11)

The other physician citing this gap also suggested that patient access to health information would alleviate the burden of the increasing complexity of medicine on the physician: “I think one of the difficulties in family medicine at the moment is you’re expected to be able to treat this wide, spectrum of the disease, but at the same time you’re being asked to be responsible for making sure that everybody that comes through the door have met all the different screening criteria”. (R15) This second physician also highlighted that evidence is

mixed about the value of some screening tests and that they require discussion with the patient: “PSA is a great example, you know there’s this great disparity amongst people as to what is really the right thing to do...if I’m going to screen somebody for the PSA I feel obliged to sit down and tell them the pros and cons of the screening which is a 10 minute discussion on its own right”. (R15)

In summary, the physicians were receptive to the idea of indicators and generally confident in their ability to capture them. The access indicators were seen as the more problematic ones, particularly for the population without a family physician. From a population perspective other data sources such as population-based surveys would be needed to capture those indicators.

## CHAPTER 8.

### PAY-FOR PERFORMANCE: AWARENESS AND ATTITUDES

Objective 3 was to assess the readiness of primary care physicians to adopt tools and incentives such as pay-for-performance in their practices.

#### *Awareness*

The physicians were asked if they were familiar with the use of incentives such as “pay-for-performance” and asked to describe them as they understood them. As noted previously, Kindig followed up his original work with the term “pay-for-population health performance system” in 2006.<sup>141</sup> The term pay-for-performance, or P4P as it is commonly referred to, has become very prevalent in the literature with a general connotation of paying for something beyond a simple volume of care provided, such as quality of care or some measure of intermediate outcome. As noted previously, at the time the interviews were carried out the first phase of the PDI Program was underway and a two physicians (in the same group) mentioned having seen a draft list of indicators.<sup>216</sup> Participation in the first phase of PDI and awareness of the draft indicators by at least a few physicians was reflected in the responses to the question.

It is noted that there have been two principal applications of P4P internationally. One is the awarding of a bonus if a certain performance target is achieved among an eligible population. England has implemented the most comprehensive application of this approach in the QOF, discussed previously. Ontario and Manitoba have used a similar approach. The second has been to make a periodic payment if a chronic disease is managed against a clinical practice guideline and documented. This approach is being used in several Canadian provinces, including BC, Saskatchewan and Nova Scotia. The draft indicators for the PDI program reflected the former of these approaches.

All of the physicians claimed to have some familiarity with P4P. One in four physicians specifically mentioned the PDI program and five physicians indicated that they had heard something about the U.K. experience with P4P. While a majority of the physicians provided a definition several provided a critique of P4P in their responses. Three types of definition were put forward:

- Payment for performance against a target - 15;
- Payment for practising against guidelines - 5; and
- Payment for providing comprehensive care - 2.

*Payment for performance against a target*

Almost two out of three physicians provided a definition that described P4P as payment for performance against target. As one put it simply: “a goal is set, the bar is set and if you reach it you’re paid. If you don’t reach it, you’re not paid.” (R6) Two physicians provided a target-based definition with reference to the U.K. experience. One recounted a description he saw in Michael Moore’s movie Sicko. “Let’s say X number of patients in his practice you know if they get their pap smears done, then they would get paid a supplement for that, or they would get paid for you know diabetics and then if they reach a target hemoglobin alc then they’d get paid for that”. (R20) One physician had heard about Ontario’s experience. “I know that Ontario has built that into their payment mechanisms.” (R7)

*Payment for practising against guidelines*

Almost one in four physicians provided a definition that described P4P as payment for treatment against evidence-based guidelines. One physician reported: “the obvious ones are hypertension and diabetes ...I think the TOP list we were given about four years ago, it was Alberta Health’s kind of research-based measurable identifiers, and I think they are within reason

for a primary practice to achieve a fairly high standard of capture. You know I know I'm around 90%." (R12) One noted that this was already underway: "Alberta has been dabbling with it. I would argue that complex care plan is more of a pay-for-performance in some way." (R10)

*Payment for providing comprehensive care*

Two physicians provided a general definition of P4P as a reward for comprehensive care. As one noted: "I think the pay-for-performance thing is to honour these physicians who do a good comprehensive job. They're not just surveying and (handing) out a prescription and goodbye. But are actually screening for disease and monitoring for disease." (R11) The second physician who defined P4P as a reward from comprehensive care suggested that it is an incentive to team-based care: "it forces them to look at alternate methods of health care delivery. It has enhanced the drive for collaborative care and finding the most competent but least paid health care professional that can do screening programs." (R12)

One physician defined P4P with reference to health outcomes: "you get additional money for patient health outcomes either documented or in some lab stuff, for outcomes of these patients who have agreed that they belong to you." (R19)

At the same time that they provided a definition of P4P, almost one in four physicians offered a critique of it. Three physicians suggested that a focus on certain indicators operates to the detriment of others. As one of them observed: "the danger for pay for performance is it is usually based on a small number of very defined indicators. And one thing we do not want to do is you know everybody gets their pap smear but nobody gets their mammogram because the pap smears are being paid and the mammograms are not being paid." (R2) Another physician described this from the perspective of family medicine and what he saw as the tendency to focus on easily measurable things:

But pay for performance implies that my work as a doctor can be measured by some of the things like I see here. And I can tell you, I can set up a system with a clinic, where all of this is going to look okay. But I'm not making good diagnoses. And I'm not engaging the patients with their own care plan...and I'm concerned about the fact that it draws attention to what can be most easily measured. As opposed to what's harder to measure. (R4)

A third physician offered a different angle on the indicator focus with reference to the experience of his physician brother in the UK:

He said that a pay for performance for A1C's came in and there was all of a sudden a surge in diagnosed diabetics...cause all of a sudden the patient with a borderline blood sugar, and impaired fasting glucose that you might have been encouraging to do exercise and lose some weight before...you're all of a sudden keen to get them labeled as a diabetic...and not only that but you'll have an easily controlled diabetic which just really makes your numbers look absolutely fabulous. (R15)

Three physicians expressed a concern about being held to account for P4P for circumstances beyond their control. Two of them raised the issue of patient compliance. As one noted: "Do you count what's been achieved, or do you count what's been attempted? If you know, send a patient for fecal occult blood screening and they don't go for it, would I be penalized because they didn't go for it, or would I get awarded for actually sending them?" (R2)

A second physician also cited the practical difficulty that patients might have with compliance: "like my patient who's working the two jobs for 20 years. Yeah, the idea that she should come in for hemoglobin A1C twice a year, it is almost overwhelming for her." (R16)

The third physician cited the role of other determining factors in patient outcomes: "I don't think outcome always is reflective of the performance. There are other factors that take hold, which include the socio-economic status of the population but there may be some of these external factors to us." (R17)

***Will Pay-for-Performance improve practice?***

Having been asked to define P4P, physicians were then asked if they felt that it would improve their performance in prevention and screening activities. Just over half of the physicians offered a discernible yes or no opinion. Among those expressing an opinion, those saying yes outnumbered those saying no by a margin of 10 to 3. However a large majority of those saying yes also provided at least one point of critique.

Among the physicians who said no, two indicated that they were already doing the behaviours most likely to be rewarded in a P4P scheme. As one noted: “for me personally no. Cause mine (screening metrics) are pretty high. For some other physicians, yeah I think they would.” (R1) Similarly a second commented: “probably not, cause I’m thinking I’m doing it all anyways. As this rolls out maybe I’ll be surprised but I think that the screening things that we’ve got in place with our questionnaires and things are already doing it.” (R3) The third physician indicating no emphasized the importance of doing the right thing for the patient: “because at the end of the day what counts to me the most is that I’m doing a good job for the patients’ sake”, although he did add that “I might change my behavior a little bit to demonstrate that I’ve done it (i.e., documenting).” (R2)

Three of the physicians answering yes commented on the positive effect of P4P in appealing to the competitive instinct of physicians of providing performance feedback. In terms of competitiveness, one physician reported: “I’m competitive okay. Because if someone says you’re not doing it correctly, I’ll say yes we are and I’ll prove it. And we’ll do our best to do it better... so when they do our audits you know I always rip open my envelope to see how I’m doing compared to everybody else... so they’re working within a population that responds to this

motivation.” (R8) Another physician discussed the role of competition and noted that they would also reward PCN staff.

Docs love the measurables. And they’re anxious to do good work ... and so when we go to a doc we’ll say here’s your average. Here’s your clinic’s average. Here’s the (Site A) and (Site B) average. And it’s generally we (reward) staff. So we may send somebody off to a holiday. Or and have competitions between communities for immunization rates.” A third physician simply noted the value of performance feedback: “and just being measured knowing that your stuff is being fed back to you. And if you really want to go somewhere you get it fed back to you, in relation to your identified peers. (R9)

Although just over half of the physicians offered a yes or no opinion on whether P4P would increase their preventive screening activity, all but five of them identified at least one problematic issue or consideration to be addressed regarding its implementation. Nine issues and considerations were identified; six of them were identified by more than one physician, and three were mentioned by just one physician. In descending order of the frequency with which the issues were cited they were:

- Risk uncertainty - 8;
- Data capture - 5;
- Potential for perverse incentives - 4;
- Evidence base of P4P - 4;
- Issues of professionalism - 4;
- Need for teamwork - 3;
- Affordability of P4P - 1;
- Rewarding only physicians - 1; and
- P4P did not work - 1.

### *Risk uncertainty*

One in three physicians mentioned some aspect of risk uncertainty as a concern. The comments reflected a general theme of being held accountable for outcomes that are beyond their control. The physicians citing risk uncertainty put forward three explanations for their concern: the uneven distribution of risk in the patient population; patient compliance; and the acknowledgement that there are determinants of health other than the physician's medical care.

The most frequently cited explanation associated with risk had to do with the uncertainty of patient presentation and subsequent compliance with recommended treatment, and also whether or not preventive behaviours encouraged by P4P do improve outcomes. As one physician reported: "if you're only achieving targets of 40% that will have to be very carefully scrutinized and it may be an ideal number. Like I figure I have a fairly good loyal clientele at this stage and I can still predict about 20% who are not going to follow along ... you're going to have human behavior factors that doctors should not be bearing the cost for." (R16) Another physician expressed it more starkly: "if somebody chooses something to do differently and that impacts their score then who really owns that poor performance? Is it the doc or the patient?" (R24) This physician went on to reference the PDI program and its emphasis on effort (diligence) and not results: "I should be measured and be held accountable for doing the thing for which there is unequivocal proof on how to do it. If I'm doing poorly, sure I should maybe be dinged, or if I'm doing incredibly well maybe I should get a bonus." (R24) One physician described an obverse aspect of risk in relation to P4P with the suggestion that lower risk patients would be more likely to be screened:

It's like a lot of the people we screen or that we see for follow-ups whether it be Paps or mammograms. Those usually are the people that have already bought in. These are the people who tend to have what I see as the higher socio-economic status, they're more educated, they're more motivated ... I don't know if we're

getting to the people that we really need to be screening ... you know the social determinants of health, the people who aren't as health literate. (R23)

The second most frequently mentioned concern about risk was the distribution of risk in the patient population, and SES was the most frequently cited factor. As one physician noted: "if you happen to be in a good demographic group it's (P4P) going to be easier than if you're in a lower socio-economic, poorer demographic group." (R3) Another noted: "you have to be careful because there are all these external influences so if we see you know you have x number of your diabetics with an A1C under 7, we know if I live in an area where the socioeconomic status is very low, financial issues, other factors, it's not always about me or my team being able to do that at least to achieve these goals ... they have to be modifiable based on the population I think that you serve and what other external factors are present." (R17)

The third category of risk was simply described terms of the importance of other determinants of health. One physician noted: "I like measuring performance I just don't want my payment to be tied to it ... I'm just thinking usually there are determinants of my performance that go beyond how hard I'm trying." (R4)

#### *Data capture*

Five physicians mentioned issues related to data capture and P4P. One physician noted the lack of uptake of the P4P-type complex care fee: "J-codes. They left \$400,000 on the table ... So what the issue is it isn't the docs, it's the workload. We do not have data entry processes. So we're moving it away from physician and having a data entry panel manager." (R9) Three physicians emphasized the importance of having an EMR. One noted: "Well, one this is you need a very robust EMR ... especially when they were talking about some of these things that they were looking at for the PDI criteria. You really have to have an EMR to pull some of that data." (R13) Two of these physicians observed that the high concentration of EMRs in Alberta

confers an advantage. As one noted: “this is one place where Alberta would have a huge leap, you know with the high uptake of electronic medical records in Alberta ... if you go to a pay-for-performance system and you don’t have electronic medical records you’re going to have a hell of a time.” (R15) Even with an EMR one physician noted that data capture is a challenge: “And even in an EMR it’s not that easy ... our EMR provider created a little template ... it’s gone and put all those PDI indicators into something called a column and so as I go through it, my physical, I tick off, have I talked about smoking? Yes/no. Is this a smoker or non-smoker? Is the tetanus up to date? Yes/no ... ” (R21)

### *Perverse incentives*

Four physicians described the potential for P4P to create perverse incentives. Two noted the potential for placing an incentive on one behavior to draw attention away from others, a point that has been made in the literature on the experience of the QOF. As one noted: “the problem is that as family physicians we have to screen for multiple, multiple things. And if you pick hypertension for example, or cholesterol or diabetes, yeah, we’ll get really, really good at that and we’ll ignore the things that we don’t pay for performance. You know so we won’t be looking for renal failure ...”. (R21) One physician reported on his experience in another province: “I know in one jurisdiction, just taking on bipolar patients you got a bonus when you hit a certain number. But they didn’t pay borderline patients in the same way and who are the more challenging and who needs more care ... and so what you saw was that everybody happily taking on bipolars, and maybe over-diagnosing bipolar disorder.” (R24) One physician described in detail the potential for P4P to encourage risk selection of patients from two perspectives. “I would think my most complicated most difficult patients would not fit under any pay-for-performance category. They’re patients who have got a variety of very vague and difficult to pin

down conditions. And if I was going to be working on a pay-for-performance system they'd be the last people in the world that I'd want on my roster. I'd want to get rid of them as soon as I could." (R15) The second perspective was the potential constraint on practice size. He suggested that it might be too challenging to manage a panel of 3,000 patients according to P4P: "I'd want to lower my numbers to maybe about 1,500 and then I'd want to service the hell out of that 1,500 only. So that I was doing everything that I had to do to make them hit the criteria. And would be providing absolutely superb treatment and prevention for that 1,500. And the other 1,500 that I fired would be wandering around the system somewhere, looking for somebody." (R15) A fourth physician noted the possibility of claiming a P4P bonus without doing the work: "But the other challenge is that, embarrassed to say this but many physicians just use those modifier (bonus) codes without actually spending the extra time." (R17)

#### *Evidence base of P4P*

Four physicians raised issues surrounding the evidence base for, and the validity of, the indicators underpinning P4P. Three of these physicians (all in the same clinic) specifically referred to the draft PDI indicators. One questioned: "who designs and where's the evidence for some of these incentive criteria? You know for example, they wanted to start to do the Hemoglobin A1C and where is the evidence to show the Hemoglobin A1C's really improve outcomes overall at certain numbers?" (R13) The second physician referred to evidence that "tight glycemic control is not helpful. Indeed it's harmful" and went on to critique the choice of other PDI indicators. With regard to the obesity indicator he noted: "You know by the time someone is 50 and obese, their lifestyle is entrenched, their eating habits are entrenched and it's next to impossible to change I think, I think the success rate is less than 2%." (R14)

With regard to hypertension, he questioned the frequency of check-ups: “but the measure that was framed in the PDI I believe was, hypertensive patient with a blood reading every six months. And if I have a stable hypertensive patient especially now with accurate home blood pressure, I see them once a year. He also challenged the indicator of a spirometry examination for patients with COPD: “If I have a patient who’s been smoking for 30 years and they’ve got a productive cough in the morning ... the diagnosis is met ... the spirometry won’t really affect the treatment.” (R14) The third physician challenged the practicality of the indicator on the calculation of Body Mass Index (BMI) for patients aged 18 or over: “what percentage of your patients over the age of 18 have had their BMI checked within the last year? Well I can tell you right now I’m going to have almost none of them, nobody.” (R15) A fourth physician questioned the involvement of specialists in the development of clinical practice guidelines that give rise to indicators: “And I know that specialists like it. But specialists get really focused on their area. And so when I talk to the nephrologists they’re sure everyone should get screened for renal failure. You know the classic is let’s screen everybody for prostate cancer. Well, you know, there’s lots of concerns about whether that’s actually a good thing to do or not.” (R21)

### *Professionalism*

Four physicians provided comments that implied that P4P might work counter to the physician’s professionalism. One reported that he was already practising P4P behaviours: “So I’m quite happy that if I get paid for doing this ... but on the other hand I think that as a professional if you’re doing your job, (you) shouldn’t have to be paid for this.” (R3) Another physician referred to professionalism in qualifying his “yes” response to whether P4P would influence behavior: “I’m old school. Do I think it would have an impact? Of course it would. It has to. But I would hate to think that was the only thing driving any profession.” Another

physician stated: “I mean this is a passion for me, it’s something that I do. Whether I get paid for it or not. Cause I feel that I’m giving value and this is what, what my idea of being a family physician is all about.” (R6)

### *Teamwork*

Three physicians commented on the importance of teamwork in doing and documenting the interventions associated with P4P. They mentioned factors including time and quality of care. In terms of doing and documenting P4P activities one physician stated: “I’m not doing that by myself, that’s not going to happen. There’s not enough of me to spread around. It’s my nurse, it’s the word being spread from the patient that I talked to that my nurse talks to that our clinical care coordinator talks to.” (R6) Another physician answered this question with reference to the capitation funding provided to the PCN saying: “To know that I don’t have to do it all. Like working with teams is so much more relaxed. And you may miss something that someone in the team will pick it up.” (R11) A third physician described the complexity of setting up a screening process and the role of a team: “But the other thing is you need a designated support staff. You know you need people that are going to help organize the people for the screening, I mean it took a lot of staff resources just to develop our panels, and confirmation panels.” (R13)

Three other issues were raised once by three different physicians.

### *Affordability of P4P*

One physician questioned the affordability of P4P, by referring to presumably international estimates of P4P as a percentage of physician income that he had heard about: “It’s been determined that (P4P research) somewhere between 15 and 30% of the current income right? So if you apply that kind of number to the number of docs practising primary care in

Alberta, the number comes out over 200 million dollars a year. In the current climate and with all that's going on it seems unlikely you know PDI is going to go that way.” (R10)

*Rewarding only physicians*

As it has been implemented to date, P4P generally rewards only physicians and not the other members of the primary care team. One physician identified this as a potential problem: “And I've heard comments (from) well, nursing right. So why should the doctors get this when this is part of their job? So perhaps pay-for-performance if you're going to do it, how (do) you operationalize that or whether it responds and respects the system within which you work or whatever.” (R19)

*P4P did not work*

One physician suggested that P4P would have only an initial flurry of activity and provided an example of how it has not worked in the case of the complex care plan: “So we get 206 bucks to fill out a complex care plan once a year. Huge initial activity and then it all died away ... And I think the reason is they didn't help. You know patients didn't really follow them ... didn't really see the need for them.” (R7)

In summary, while a number of physicians did indicate that P4P would improve their level of preventive screening activity, through their qualifying comments they expressed considerable skepticism. They identified essentially all of the criticisms of P4P that have appeared in the literature. What is most striking is the degree of concern about the risk that physicians would be exposed to in P4P programs, and it should be emphasized that to date P4P has concentrated mainly on process and not outcome measures.

## CHAPTER 9.

## PRACTICE SUPPORTS

Objective 4 was to assess current and potential linkages between primary care and other sectors. This was probed through an open-ended question about links to other health and social service agencies in general, and schools in particular. When the physicians were asked to describe linkages with other health and social service agencies that support their practice, for the most part they described the array of health professionals working either on full or part-time within their PCN. They also described both barriers and facilitators to promoting a multidisciplinary practice environment. To the limited degree that they mentioned linkages with other agencies this tended to be the home care program and this was reported in both positive and negative lights.

There was a clear indication that the introduction of the PCN and the capitation funding has greatly enhanced the collaboration between physicians and other health professionals. As one noted:

We get paid for a meeting, but otherwise the funding goes either to programs or to extending staffing within the clinic that did not exist pre PCN. So, everything from like our clinical care coordinator, the nurse we work with. That was something that we did not function within our clinic setting. As we got into that, and the capitated funding we had there, it totally changed the structure and number of people under this roof ... it extends the circle of our team. (R6)

In addition, three physicians raised the issue of governance in relation to the broader health system and two physicians fairly explicitly described how they were shifting to a population health approach.

It is of particular interest that two physicians raised issues of employment equity both within PCNs and between PCNs and other parts of the health system. This is not a new issue in

health care, but to date it has not received much attention in the context of new primary care models.

### *Health professionals*

In describing the supports to their practices, the physicians mentioned nine categories of health professionals more than once. In descending order of frequency these were:

Nurses – 23

Social Workers – 6

Mental Health (coordinators/  
psychologists/psychiatrists) – 16

Administrative personnel – 4

Dietitians – 15

Respiratory/pulmonary technicians – 3

Pharmacists – 15

Navigators – 2

Kinesiologists/physiotherapists – 6

By far the most frequently mentioned health professionals were in the areas of nursing, mental health, dietetics and pharmacy. Virtually all of the physicians reported collaborating with nursing in a variety of specializations. Half of the physicians specifically mentioned a “chronic disease nurse”. They did not generally elaborate on what activities these chronic disease nurses carried out but one physician referred to screening. Another noted “She’s probably better teaching and better follow-up for certain things than we have time for”. (R3) Several nursing specializations were reported, including diabetes care, home care, palliative care, psychiatry and anti-coagulation therapy. Two physicians reported working with a combination of a nurse practitioner (NP) and licensed practical nurses (LPNs). One described in detail how the activities of the NP and LPN and how they enabled him to do other things:

She does ... suture removal, cast removal, wart and liquid nitrogen treatments of other skin lesions. And all the immunization, the LPNs all have their vaccination certificate. So they have taken that load off. Simple things like B12 and allergies. They don’t have to see the physician, just book directly with the LPN and come in

and get their shot and go. And we just bill for the injection code. But it increases our capacity to see other patients, cause we're not wasting time. (R12)

Mental health was the next most frequently cited type of provider, by two out of three physicians. The most commonly cited category was mental health (worker or coordinator or counselor), by almost one in two physicians. As one physician described the function of mental health personnel: "we have several mental health counselors, who usually do kind of intake assessments, triage and help steer the patient in the direction that's most appropriate." (R5) Another commented about his mental health coordinator: "she's priceless, from coordinating all of the mental health and social work, social service type stuff that patients need. So she's invaluable." (R13) Seven physicians mentioned collaboration with psychiatrists and five mentioned psychologists. Four mentioned both psychologists and psychiatrists. These services are generally provided on a periodic basis. For example: "we have that (mental health) counselor who comes on a weekly basis ... every Monday morning she's here. The psychiatrist comes on a monthly basis." (R6) Four physicians mentioned a "behavioural health consultant". In terms of their qualifications one noted: "I think it's a PhD-trained psychologist." (R19) In terms of their function, one described how the behavioural health consultant "mostly does some motivational counseling ... she's here actually at the same time as my chronic disease nurse. So if the chronic disease nurse has motivational issues (the clients) then it can be picked up by the behavioural consultant, so those two are paired." (R18) One physician from a large PCN described a comprehensive offering of mental health services. "We have a PCN behavioural health consultant. We have adolescent shared mental health for the PCN and we actually have a shared mental health which is not through the PCN so this is for adults. So we have access both to a pediatric psychiatrist and adult psychiatrist, pediatric psychologist and adult mental health

worker.” (R21) In addition two physicians mentioned programs available from Alberta Mental Health.

Dietitians were the next most frequently cited providers, by almost two out of three physicians, but the physicians offered no exploratory commentary on the functions that they performed.

Pharmacists were mentioned by 15 physicians. Several physicians provided explanation of their roles in the PCN. As one described the pharmacist in his PCN: “she can offer a lot of support to seniors with structured medication reviews and anti-coagulation.” (R13) Another noted: “they’ve actually become absolute experts in dealing with anti-coagulation ... those 500 patients on anti-coagulation were a total nightmare to us before. Now those nightmares we just hand them over to the pharmacist and they deal with them.” (R15)

One in four physicians cited collaboration with a kinesiologist or physiotherapist. There was very little description provided of their role. One physician said: “we have the one kinesiologist who works for exercise, fitness that kind of thing.” (R5) Another noted that space constraints were a barrier to co-location. “But the kinesiologist works elsewhere because there’s no room for a kinesiologist.” (R4) The issue of funding of physiotherapy services was cited by two physicians. One physician noted that a hospital in the region had used new funding to establish a new physiotherapy referral service and that the PCN had collaborated with them with the result that: “now I actually refer patients to them whereas before I’d say, oh you won’t get seen for three months, you’re going to have to pay for private physio.” (R8) Another described a creative solution involving vouchers: “their first business model they did give these guys vouchers for physiotherapy. And they worked on some deal with the physiotherapists in their

community ... and then they don't have to pay the physio, you don't have to find the space for the physio." (R19) That same physician emphasized the value of physiotherapy services with the observation: "I refer to one physiotherapist who I call God." (R19) One other physician mentioned that they were going to start providing vouchers for physiotherapy. While no detail was provided in the answers the voucher would most likely be funded from the PCN capitation funding.

One in four physicians mentioned collaboration with social workers. One described how the social worker helped to sort out income security issues: "or you know like I'll have a geriatric guy who needs help who doesn't have the finances. He's (social worker) superb. He finds solutions, he helps them. These are people who cannot do forms and applications. And they have no idea what's available." (R6) Another described working with a hospital-based social worker: "a social worker for the town which helps people with their in-patient nursing, home patients and seniors... and I have a way of doing referrals to them quite easily through my EHR so it makes it quite easy." (R22)

Four physicians mentioned using administrative personnel to perform roles such as coordinating referrals. For example: "I have a booking clerk who is trained by the PCN to find the best consults." (R4) Another noted: "the other things we use quite a bit are called referral coordinators and program coordinators. And they're trying to help us steer the patient or navigate the patient through the entering in and coming back from the world of specialty care." (R5) One physician spoke about a future role in screening activities according to clinical practice guidelines for a "medical office assistant" which he described as: "a person who has had a training in terminology, like medical terminology, who has very basic knowledge of disease." (R10)

Three physicians mentioned having the services of a respiratory/pulmonary technician within their PCN.

Two physicians described the role of a “navigator”. As one put it: “a health consultant that’s kind of like a bit of a navigator, chronic disease person. Kind of a bit of a way finder process person ... connecting the dot person.” (R19) The other said: “we’ve also got navigators ... are actually nurses, who’ve really gotten to know the system very well, so that what you’d have is you get a person who has got some sort of say an economic issue and can’t afford drugs and may qualify for some sort of program they can kind of help navigate them to the right place.” (R21)

Aside from these professionals, many of which were mentioned by numerous physicians, there were single mentions of occupational therapist, speech language pathologist and grief counselor. Aside from psychiatry there were also single mentions of other medical specialty services, including pediatrics, cardiology, ear, nose and throat and geriatrics.

Interestingly, only one physician mentioned the PCN administrator, saying; “our PCN admin has been generally quite supportive”. (R12)

### ***Barriers and enablers***

The physicians described several barriers and enablers to working with other professionals and services. A few, such as funding and liaison with home care, were cited as barriers by some physicians and enablers by others.

Three physicians described the challenge of space constraints as a barrier to working with other providers. As one noted: “we’ve basically taken everything the PCN will give us. And, so they’re (other providers) all in here for a half day here, a half day there, but what it has done, is it’s produced major stresses on the space in this place cause you got docs, and you’ve got all

these people coming in.” R21 Another described how space constraints resulted in some services being physically located elsewhere. For example: “the INR (anti-coagulation) nurse works elsewhere because she just talks to patients on the phone anyway.” (R4)

While some physicians reported having electronic communication capability with other providers through an EHR, one noted that this remained an outstanding issue in his practice from the point of view of patients. “The number one request that the chronic disease nurses and dietitians say patients are making is, can I please communicate with you electronically.” (R4) Looking ahead, he added, “but I think patients’ access to their own data and a meaningful way to communicate with their own doctor is going to be a really important step.” (R4)

Two physicians described that the organization of home care is a barrier. One noted that it has been a longstanding problem. “We’ve had trouble getting alignment with home care ... so this goes back probably 10, 15 years we said, listen, we’ve got enough patients on home care that if you could assign one or two home care nurses to the medical clinic we could make this thing work really well but ... the larger administrative body just couldn’t see making that happen.” (R15) Another described how the organization of home care prevented her from getting to know the nurses and the resulting uncertainty about patient care. “Community health care ... is invisible to us, because we don’t ever get to know any of the nurses very well and we call one and oh they’ve gone and another nurse will speak to us ... sometimes we’ll get fax communication. And we’ll fax a person back. We have no idea what that person looks like. And we don’t know if they know the whole history of the patient.” (R8)

On the other hand two physicians described positive relationships with home care. As one noted; “home care has been pretty helpful here. And there’s a few variations ... palliative home care is more intensive in terms of hours per week available for a patient. And you know there’s

short term intervention home care often when people leave hospital.” (R5) The other physician, located in a rural area noted: “all it takes is a phone call. And they’re into a home, they’re assessing, they may not be the ones who continue to follow up going in ... but they’re on the list of being looked in on.” (R6)

One physician cited both regulatory issues and the fee-for-service physician compensation mechanism as a barrier to collaboration: “The biggest problem is the whole compensation package. At the moment if my nurse follows up on my hypertensive patients, which she’s capable of doing, first of all she can’t prescribe for them which is a bit of a pain in the neck ... but I also don’t get to bill for that patient unless I actually physically see them myself. If you take the whites of the eyes rule out I can probably increase the number of patients that the two of us are seeing by 25 to 30% in a given day. (R15)

Two physicians referred to the classical challenge of introducing innovation. As one noted generally: “right now that of the 52 docs (in the RCN) there are probably 30 that are really bought into it, I mean you know (we) are dragging the others along by their heels ... even within a clinic like this we’ve got some people who are really enthusiastic about it and there’s others who are pretty lukewarm.” (R15) The other commented specifically on teamwork. ” ... the whole integration of the health care team has been an interesting experiment ... some of the older physicians are very resistant to implementation ... and whereas we had many new doctors moving into practices (they) were much more open and willing to embrace the team approach because they didn’t know any better.” (R12)

One physician described cultural issues and SES as challenges in designing appropriate programs: “the need is truly there getting the right programs going and making sure that the right people are in them. And then getting people to come to the programs too is challenging. Even if

they're the greatest programs in the world. And developed with great cultural sensitivity and there are translators and everything." (R18)

In terms of the capitation funding that is used to fund the services of other providers, one mentioned its insufficiency and another raised concerns about its sustainability. In terms of sufficiency, one physician commented: "all this \$50.00 per head which anybody will tell you is used up in a heartbeat." (R19) This physician commented further on lack of infrastructure: "whose responsibility is it to build and design our infrastructure? ... there's nothing in the PCN around significant funding for infrastructure." (R19) Another physician linked uncertainty about the PCN funding to his PCN's tendency to secure additional services on a contractual basis: "They're not employees they're contractors. And also you know limits our risk in the event you know sustainability of PCN funding ... it seems highly unlikely that they're going to dump the PCN funding in the negotiated agreement." (R10)

On a positive note however, two physicians praised the collaboration that the PCN funding had enabled. In addition to the physician cited at the beginning of this section another noted: "well, I would say before the primary care networks came in we really had no supports. Like so we were basically fee-for-service. You get paid for every patient you see, and that was it ... But with the PCN now there's additional funding for primary care so we're trying to advocate for multi-disciplinary teams, we're trying to get like a dietician that can come in a counselor, all of those kinds of things." (R20)

One physician also praised the flexibility of the PCN funding arrangement: "So you give some overarching rules, give some overarching guidance and then you let the group of docs and others on the primary care team figure out to use these resources. I think it's brilliant." (R24)

Two physicians described the co-location of other providers in the PCN as an enabler of collaboration. As one noted: “the more that those networks provide staff who work in my clinic the better. Because the more these people are located at some hub, like a network office the less team-like the experience is for the patient.” (R4) The other cautioned however that: “so the co-location I think is valuable, the challenges with co-location are space and administrative supports.” (R17)

One physician cited the benefit of the PCN in restoring collegiality among physicians in the community. “So what the PCN permitted was for the first time in 15 years physicians from different clinics in a community getting together and talking about stuff and reestablishing collegial relationships.” (R10)

The previously cited AIM project was cited by one physician as facilitating collaboration in the PCN around the management of the panel population:

AIM has provided us with both the information and the tools for measurement. And in fact I have a weekly meeting in my clinic with three or four docs plus two or three nurses and other staff every week ... it's called the AIM meeting ... basically the real topic is practice quality improvement. So we talk about everything from reception, work flow to mailing out care plans to patients. (R4)

Three physicians commented on the role of the physician in governance of the PCN and the relationship between the PCN and the health system. One physician spoke enthusiastically about the opportunity to become more involved in governance that is afforded by the PCN: “And I guess it's exciting times ... with the PCNs it's just allowed doctors to be more involved in the actual direction of care in the community. Whereas in the past you had hospital boards and nice people and everything, but no active physicians or nurse are allowed on those boards.” (R11) He went on to add though: “we've not trained to be a manager of those resources.” (R11) A second physician described in more detail the challenges physicians are facing in PCN governance. “...

There's probably a thought within government that the docs really don't know how to run this stuff so maybe we'll just have AHS (Alberta Health Services) run them .. and I think that's one of the risks we have as docs is that from a governance point of view we really have to up our game." (R13) He also expressed a concern about the role of physicians in setting policy within the PCN: "And I'm concerned that there's too much on the staff side that is developing policy or doing policy on the fly. And the docs aren't doing a good enough job of some actually policy."

(R13) A third physician suggested that physicians and PCNs could play a role in helping Alberta Health Services to shape local service delivery.

But in the way that Alberta Health Services has sort of helped physicians make a business plan for the provision of community-based care, I'm proposing that we just reverse the direction of that relationship and governance. Such that physician leaders you know through PCN boards would help Alberta Health Services set up their business plan in a geographic defined area ... so I'm kind of proposing a high level joint venture or board kind of thing. (R10)

Two physicians spoke specifically to a population health perspective with respect to their panel and the community. One described the dilemma of thinking about the population/community on one hand and the results of the AIM measures that suggest that panels are too large: "I think if you're going to provide health to a population in this day and age, you've got to utilize some sort of a group mentality ... And in fact if you look at the advice that AIM has been giving to the docs is they're saying your panels are too big ..." He went on to suggest: "I may not be able to provide everything to all my 3,000 patients but I'll be able to take care of the most needy and everybody will get a bit of me ... I guess it's a question of whether you define your population as being your panel or your community ... I think when you sign on into medicine you're supposed to be a resource for your community. It's supposed to extend beyond the walls of your office." (R15) The other physician described how the PCN had resulted in the physicians thinking more about the health of their community.

... The PCNs have been really important at connecting you know and getting docs to start thinking, outside of okay, now we've got a group of 100 of us and we've got a community, which has got very poor health outcomes ... the most heart attacks the most strokes ... the worst cancer you know lung cancer rates. So as you start to look at that as a group you start saying okay how do we do things more broadly for this particular community ... and so what the PCN had done is it's connected us to the community in a way that we weren't before ... and you're no longer the mom and pop kind of operation dealing with your patients and your patients only. You are thinking of little bit more globally. (R21)

Two physicians raised employment equity issues. One cited the commonly observed difference in wages between the unionized institutional sector and the community sector: "And the ones (nurses) that come from region are unionized and so if they come out to the PCN they have this stuff about equity and you've got these PCN paid nurses (versus) regional paid nurses and what do you do with that?" (R19)

The other physician described it in terms of the "equal pay for equal work" issues, between RNs and LPNs. "The RNs were delivering patient counseling. And working with chronic disease, interestingly we had some excellent LPNs that were initially doing similar work. But they get to a point where they felt they were doing exactly the same work and stopped, they refused to do it because they were getting half as much money for the same quality of primary care. So they've had an internal clinic revolt." (R12) He went on to add that "the nurse practitioners want the same salary as the GPs and the nurses want what the nurse practitioners want." (R12)

In summary, the physicians reported a rich variety of collaborative practice arrangements within their PCNs, as well as the challenges of space and various aspects of compensation and funding.

CHAPTER 10.  
LINKAGES WITH SCHOOLS

The physicians were asked if they had any linkages with the schools that serve their panel populations and the extent to which schools have the potential to influence the health of their panels.

***Engagement with schools***

Half of the physicians reported that either they personally or their PCN had either a direct or indirect linkage with the school system, and close to two-thirds indicated that schools have the potential to influence health.

Among those indicating involvement with schools, seven types of activity were reported. The most frequently cited were providing education, providing a “career day” or related function, and counseling students with problems. There were single mentions of developmental screening, prevention and an Aboriginal Youth Ambassador program.

In terms of providing education, three physicians described their own experience with schools and one described a PCN program. As one noted: “so I’ve done annual classes in sex education. Not my choice, but whatever, so I’ve done that for a long time.” (R7) Another mentioned: “when my own kids were in school I would go and help the teacher (with) medical education or science education.” (R16) A third indicated that she had offered to provide education about women’s health issues and contraception but that it had not occurred yet. A fourth physician described an impending partnership between the PCN and Ronald McDonald House: “We’re going to have a mobile bus, and the bus is meant to deal with kids’ issues. And so one of the thoughts is that we’ll somehow link with schools and send the bus and park it in the parking lot and have a mobile classroom.” (R21)

Three physicians reported some form of activity intended to interest students in pursuing health professional careers. One physician reported that his PCN manager had brought students in for a “career day”. “They (school) were looking for a work experience program for some of their grade 9 students. And so we did have ... some of the grade 9 students come here ... And some of them ... kind of enjoyed you know getting some work doing things like you know, filing and scanning documents and stuff like that.” (R5) Another physician described being a role model in a multicultural context: “So I do a career day in my old high school. And so that high school again is very multicultural and they’re immigrants. You know I also serve on the medical (school) admissions committee and so they’re always saying that you know the people who are getting in are the privileged ... I’m trying to you know, let these kids know that yeah this is a potential profession for them.” (R20) A third physician noted that: “the only connection to schools that our PCN had is our prize in the Youth Science Fair for projects that were health care related.” (R17)

Three physicians mentioned providing clinical consultation to students, either at the request of the school or on the recommendation of the school to the parent. As one noted: “sometimes the counselors request specific consultation with students. And they (students) don’t want to come to the clinic to do it. So we sometimes go to the school.” (R7) Another noted: “our relationship with the schools is more indirect. They tell the parent to take their kid to go to the doctor. And it’s never formalized beyond that.” (R6)

There were single mentions of four other types of involvement with schools. One physician reported that his PCN was engaged in pre-school developmental screening. “We’ve been already spending a lot of PCN dollars ... at the school entry piece. So we’ve been having meetings here with public health and (the) school and legal system ... we have two pediatricians,

we have community docs, we have xxx who's a developmental pediatrician." (R9) This physician also mentioned that they had started swimming and ice skating programs aimed at young people.

Another physician reported mixed success with an asthma prevention program in schools. "We wanted to raise earlier identification for out of control asthma (for) kids in schools. And we did try to get connected with public board and the private schools. And only the private schools cared to do much, but we did get some traction." (R19)

One physician reported that his PCN had been successful in obtaining \$250,000 in federal funding for Aboriginal health programming. "And it was in part youth ambassadors for the prevention and promotion of health. We went into local high schools and found sort of ambassadors, youth leaders ... So that's been running over the last two to three years ... they have a walk course and you know there's a good program around diabetes patients. Another one hip hop dancing ... ". (R10) This physician also cited the secondary benefit of the spread of information to the family: "educate the children, the students, but also their families, you know the older generation." (R10) Other physicians commented on this secondary benefit and this will be highlighted further below.

Another physician described a program on smokeless tobacco offered by the PCN. "... We take it out to coaches of sports teams; we take it out to schools so there is a little bit of the health promotion stuff that goes on through the PCN." (R15)

### ***Potential for schools to influence health***

Almost two in three physicians gave an example of the potential of the schools to influence health. The one example with multiple mentions was education about healthy lifestyles, which was mentioned by 10 physicians. In addition, there were single mentions of

several of the areas where physicians reported having linkages and one suggestion of using schools for surveillance of communicable disease.

In terms of lifestyle education one physician emphasized that the school can play a role at a critical juncture in an adolescent's life: "For things like obesity management, for things like lifestyle choices I think that's where they (schools) have to start ... by the time they're 15 and obese and sedentary you know well you're not going to change them." (R14)

The physicians commented on the role of the school in promoting healthy lifestyle both from an educational standpoint and by setting an example. In terms of education, one physician enumerated several areas: "the two big areas would be nutrition and exercise. And I guess some as kids go through this (period) sex education health education, smoking cessation, drug, and alcohol education." (R3)

In terms of setting an example, one physician noted: "my husband's a principal, they don't put pop in the machines, and then they sit there and they get dusty." (R19) Another physician recounted what he had heard about the U.K. Oxford Health Trust's Healthy School Program as a potential approach: "They set a series of criteria which meant a certain amount of mandatory exercise, no pop machines in the hallways ... and if you passed you could put the Oxford Trust's Seal of Approval as a healthy school ... talk about brilliant! What parent wants to send (their children) to an unhealthy school?" (R15)

One physician added a caution about the ability of the school to influence lifestyle. "... I'm a firm believer that it also depends on what happens at home. Like you can have healthy lunch room programs and all those sorts of things. But you know the bulk of the decisions and the bulk of the time is what happens at home." (R17)

Five other potential roles of the school were mentioned by a single physician each. One physician gave an example of how health education can result in students influencing their parents. “A good example is a “Do Bugs Need Drugs” program. The infectious disease lady in Edmonton at the time, started that program and really pushed it through the school ... grade five kids would come home saying; “we don’t need to have antibiotics for our sore ears. I even saw kids in the office (saying) “I don’t want to take antibiotics when their mother had brought them in.” (R16) Three other physicians also mentioned the role of students influencing parents. As one said: “you know just like influenza, kids bring home stuff from school and it catches on to parents.” (R13)

Three areas of potential involvement with schools that have been discussed above that were cited are counseling, developmental screening and education. One additional area was the potential role of the school in disease surveillance. As one physician reflected on the Fall 2009 H1N1 pandemic, “you know I was concerned that the surveillance process of public health was focused in the hospital. When we were seeing a lot in our clinic and probably the focus should have been there.” (R7)

Four physicians described funding as a challenge in promoting greater involvement in school health. One noted that moving beyond the current informal referral process “would be a major shift and potentially even require a whole different funding model of some sort ... would we in our clinic situation be well advised to say one physician will do this kind of thing. And create a level of expertise, and a relationship with the school and personnel there?” (R6) Another physician suggested that health promotion, or wellness as he termed it, should be budgeted in some place other than health. “I think it (wellness) should either be under the banner of education or social services. When you put it under the banner of health, health dominates. It’s

treatment of disease will gobble up every single penny.” (R15) A third physician suggested that the diagnosis of behavior problems and learning disabilities is underfunded. “You know that would be a place where governments could be spending money that would save money in the long term as you get more access to occupational therapists that can do some of the psycho-ed assessments and the psychologists can help in that process.” (R23) A fourth physician noted the burden that is being placed on schools. “But the problem there is that you know just like health, education is getting offloaded a lot of responsibilities that there’s no funding for.” (R13)

Finally two physicians cited barriers to school involvement other than funding. One simply cited a lack of time. “And it’s not like I wouldn’t be interested in doing that. But it’s challenging because I have a full-time practice here.” (R18) Another noted the organizational challenge: “probably the reason is that it’s just too many of them (schools). Too many school boards, too many private schools and so on ... with the urban metropolitan kind of practice you know, there’s too many doctors per school and too many schools per doctor.” (R2)

In summary, the physicians clearly recognize the value and potential of school linkages. Although no benchmark comparison data are available, the fact that half indicated some level of involvement and that several mentioned the role of the PCN, this would seem to augur well for continued growth in the future.

## CHAPTER 11.

### DISCUSSION, LIMITATIONS, FUTURE RESEARCH AND CONCLUSION

The goal of this thesis was to establish the potential and preparedness for primary care physicians to adopt a population health approach with their panels of patients. Based on the results, the attainment of this goal can be assessed against the four key elements of a population health approach that were identified in the introduction:

- Understanding the social determinants of health and their relationship to health inequalities;
- Focusing on health promotion and disease prevention;
- Collaborating within the health sector and sectors outside health such as education; and
- The emerging dimension of “population health management” that emphasizes aggregate performance measurement and proactive outreach to the entire patient roster (not just those who come in for appointments).

#### *Understanding social determinants*

With reference to the conceptual framework that was set out it is evident that the physicians were highly aware of the social determinants of health, with almost half of them mentioning at least five. What was most striking was the reported awareness of the importance of SES as a determinant of health. SES was the second most frequently mentioned descriptor of the panel; and it was the most frequently cited determinant of health followed closely by education level. If one considers the general public as the benchmark then the physicians demonstrated a much greater awareness of the importance of SES as a determinant of health. Indeed the most recent public opinion data continue to place education and income data well down the list. A May 2012 survey conducted by Ekos Research among the general population

found that respondents were most likely to rate a publicly-funded health care system and lifestyle as “extremely important” determinants of overall population health (52% and 45%) and least likely to rate education and income as extremely important (21% and 15%).<sup>227</sup> An August 2012 survey of the Canadian public found that the two top ranked determinants were tobacco use and health care, while education level and income level ranked 14<sup>th</sup> and 15<sup>th</sup> respectively<sup>228</sup>. In addition to income and education, physicians also mentioned employment status and housing.

At the physician practice level there is a two-fold challenge of first, identifying low income patients and second, offering an intervention. None of the physicians mentioned systematically recording income or any other measure of SES and just a few mentioned interventions such as advocating for free medications or having a social worker assist patients to access income benefits. Gottlieb et al. have recently noted that there is little guidance for health providers on addressing social determinants and they set out a framework that describes how to collect data and target interventions at the levels of the political, the institutional and the community. At the patient level, for example, they suggest that disease risk can be adjusted for known social determinant risks.<sup>229</sup> Hill et al. have proposed that systematic collection of social determinants data should include income, education, housing status and food security.<sup>230</sup> As noted above, the Health Providers Against Poverty group in Toronto has developed an intervention tool that begins with the simple question “do you ever have difficulty making ends meet at the end of the month?”<sup>86</sup> However it is noted that CIHI’s updated list of Pan-Canadian Primary Health Care Indicators does not include the dimension of equity or inequality.<sup>231</sup> CIHI’s draft Primary Care Electronic Medical Record Content Standard includes a code for the clients highest education and a code for housing status, but no code for income level.<sup>232</sup> Beyond systematic measurement of social determinants of health there is an issue that has been raised in

the critical literature of population health about the need to understand the underlying processes that generate social inequalities and subsequently health inequalities. As Coburn et al. observed about the Evans and Soddart framework, “there is little interest in what surely should be a vital question: what are the causes of differences in SES?”<sup>233</sup> When the physicians mentioned SES as either a descriptor of their panel or as a determinant of health, they did not elaborate further on the nature of its relationship to health. As Madonald et al. have shown, this is a common issue in Canadian research. In their review of 241 Canadian research studies on income and health, they found that almost two-thirds (64%) included no conceptualization of how income influences health.<sup>234</sup> Macdonald et al. identified three conceptual approaches for how income acts as a casual influence on health:

- Materialist-individual income is a determinant of health;
- Neo-materialist – individual income and social infrastructure determine health; and
- Psychosocial comparisons in relation to the social hierarchy determine health.

In their review they found that the Canadian studies were most likely to include individual conceptualizations of the income-health relationship followed by social structural (neo-materialist) conceptions. They reported further that only one-tenth of the studies explicitly considered the political and economic forces that determine distribution (e.g., social welfare, taxation and employment policies).<sup>234</sup> If these findings represent the state of the Canadian health research community it is not surprising that the physicians did not go into greater detail about the SES-health relationship.

While the physicians identified a range of determinants of health, among which SES was the most frequently mentioned, they were less likely to identify health inequalities in their panel populations and less likely still to identify strategies for mitigating the effects of those

inequalities. As noted previously, the CanMEDS roles and the advocate role in particular have been fairly recently been adopted for family physicians. Hence it is likely that they were not acquainted with strategies to identify health inequalities and to address them. This possibility is supported by a recent survey of U.S. primary care physicians. While more than four in five physicians (85%) agreed that addressing patients' social needs was as important as addressing their medical conditions, just over half (54%) said they were well-informed about the resources available to address their patients' unmet social needs and only one-fifth (20%) felt confident about their ability to meet patients' social needs.<sup>235</sup> In the past few years the term "social prescribing" has come into use in the United Kingdom to describe expanding options outside the immediate GP practice setting to address health inequalities resulting from social circumstances.<sup>236</sup> There may also be practical constraints. The CMA carried out qualitative interviews with 32 physicians across Canada in 2012 on interventions, barriers and facilitators to promoting health equity in clinical practice. The physicians identified 10 barriers, including an exclusive fee-for-service payment mode, lack of information about programs and services and lack of time.<sup>237</sup>

While one physician described how job loss in a community had resulted in problems such as gambling the physicians did not comment on the underlying political and economic factors that produce the distribution of income and other opportunities in the population, although this could be due to the fact that the interview protocol asked only generally about determinants of health and presence of health inequalities. Interestingly, recently published Canadian research among two focus groups of persons with public health and social service backgrounds on social determinants of health found that "both groups failed to reference

inequality, i.e., inequitable distribution of power and resources as a structural driver of differential health outcomes.”<sup>238</sup>

Following an extensive consultation on a draft report on the role of health professionals in health equity, Sir Michael Marmot’s Institute for Health Equity has published a comprehensive report that contains 19 statements for action that come from 14 different health professional groups, including 6 medical organizations. The section on advocacy spells out what health professionals can do in practice and in education but also addresses the issue of structural determinants by calling for advocacy for national policy change on the part of individuals and professional bodies for changes “that would improve the social and economic conditions in which people live, and particularly those that would reduce inequalities in those conditions.”<sup>239(p59)</sup> This role may be better suited to professional organizations and their volunteers than to individual practitioners. Sir Michael’s report would suggest that while the 1980 Black Report may have had an effect on down playing the role of health care in relation to health and health inequalities we have come full circle.

Outreach efforts on the part of public health agencies, regional health authorities and awareness raising on the part of medical professional associations to promote tools and the advancement of the health advocate role would be helpful. The fact that the perceived importance of income as a determinant of health continues to be so low in the Canadian population, probably translates into a low ranking as a policy priority of governments. This raises a challenge for physician and other health professional organizations to advocate beyond the customary health sphere for structural determinants such as income and education, in addition to better access to things like prescription drugs and rehabilitative services that lie outside the ambit of the Canada Health Act.

Aside from the emphasis that the physicians put on SES and education, is not surprising that access to, and utilization of, health care was the fourth most frequently cited determinant of health although it accounted for only one-tenth of all mentions of determinants of health. It was cited mainly as a positive determinant of health (e.g. prevention screening) but it was also cited as a marker of poor health by a few physicians. This latter point is interesting given the recent interest in the identification of patients with high frequency utilization and the development of strategies to mitigate it. Research on the concentration of health expenditures has taken place in the United States for some time and there is growing interest in Canada. In Ontario, Wodchis has reported that in 2007/08, just 1% of the population accounted for 34% of Ontario's public health expenditure.<sup>240</sup> Exploration of who these patients are in the United States is leading to strategies such as personalized outreach services provided by a team that are being shown to be effective in reducing high frequency utilization.<sup>241</sup> In 2012 the Ontario Ministry of Health announced a program called Health Links that is intended to better meet the needs of seniors and others with complex conditions and reduce things such as unnecessary hospitalization.<sup>242</sup>

### ***Health promotion and disease prevention***

While the physicians were most likely to report that their contributions to their panels' health were in the area of preventive screening and lifestyle counseling, in general they reported that they spent significantly more time in the provision of acute treatment and chronic disease management than on prevention.

It is evident from the responses that two critical success factors in shifting the balance toward prevention will be the EMR and the role of the multidisciplinary team. As described by the physicians a fully functional EMR will enable the identification of patients due for screening tests, and one reported on how much her screening performance had improved. At least in the

medium term, this will require the efforts of a team member to identify the patients and then contact them to come in, as none of the physicians mentioned the prospect of fully automating the process using the EMR. Some of the physicians mentioned that they were already doing this. The effectiveness of reminder and recall systems has been well-documented for some time but I would speculate that what will be required is a shift in thinking from using the EMR to dealing with individual patients to using it as a tool to manage the health care of the patient panel.<sup>243</sup> Looking further ahead still one physician mentioned a greater role for the patient in managing their health information. There are examples in Canada of personal electronic health records that can be integrated with a physician EMR, although to present the existing physician payment models do not generally cover electronic communication.<sup>244</sup>

With regard to the EMR, while all physicians reported having a basic capability with it, there is wide variability in capability. The value of practice tools such as the TOP program that can be built into the EMR is quite evident. At the present time it would appear that there are more clinical measures available than behavioral measures such as smoking status. However, Alberta has recently introduced an Alberta Screening and Prevention initiative that expands the TOP program to include weight and height, exercise and alcohol use.<sup>245</sup> One issue that was not mentioned in answering the general question about measurement capability was the need for standardized indicators that could be used to either compile indicators at higher levels of aggregation or to compare across practices.

### ***Collaboration within the health and other sectors***

The issue of linkages to other sectors and particularly re-allocation between sectors remains essentially at the frontier. When the physicians were asked about supports to their practices they cited either other health sectors such as home care or other health professionals

almost exclusively. Something that was striking was that some form of mental health worker was the second most frequently type of provider after nursing. What is most evident is that the physicians are clearly enthusiastic about working with these other providers and there is demand for more collaboration. In fact the Alberta government has recently increased the annual amount of per capita funding from \$50 to \$62. In the immediate term physical space was mentioned as a barrier by several physicians. In the longer term, there will likely be a challenge of the funding mixture of fee-for-service of physician services and the capitation funding that covers the other providers. Employment equity was also mentioned as an issue on the horizon.

The one non-health sector that was specifically probed for was linkages with schools and it was interesting that half of the physicians reported a direct or indirect linkage, and two-thirds provided an example of the potential of schools to influence health.

Given the high reported awareness of the social determinants of health one might expect that there is the potential for linkages with other community sectors such as social welfare. As for inter-sectoral resource re-allocation, while some partnerships are starting to form in the United States this does not appear to be on the immediate horizon in Canada.<sup>156</sup>

It is likely that scale of operation will be a consideration in the ability to form inter-sectoral partnerships. The 30 PCNs for which the information was available in 2009 had an average 56 physicians with the greatest number being 260 (Appendix B). Isham et al. have recently reported on how Minnesota-based HealthPartners has begun to implement a “community business model” to focus on nonclinical determinants of health outcomes. They have made sizable investments in the community, including \$300,000 for a school program to encourage children to eat more fruit and vegetables and \$200,000 to provide academic and social

support to children in an inner-city area.<sup>246</sup> However HealthPartners is the largest health contract network in Minnesota with more than 15,000 physicians and nearly 4,000 clinics.<sup>247</sup>

More generally, the issue of linkages between PCNs and other parts of the health care system was raised in early 2010, when AHS began consulting on a discussion paper that put forward an array of primary care models, including “enhanced Primary Care Networks” that would provide for greater integration and accountability.<sup>248</sup> In addition to the introduction of FCCs in 2012, Alberta has been introducing Strategic Clinical Networks (SCNs) that are intended to promote the sharing of best practices across Alberta to improve quality in the delivery of care and also to promote a seamless interface between primary care and other parts of the health care system. The SCNs bring together clinicians, researchers, government representatives, not-for-profit group, patients and families.<sup>249</sup> There are six SCNs in operation and six more are targeted to start in 2013, including two cross-cutting SCNs: Population Health and Health Promotion; and Primary Care and Chronic Disease Management.<sup>250</sup>

### ***Population Health Management***

Over the past decade the health sector has adopted the mantra “you cannot manage what you cannot measure”. Based on the numerous references the physicians made to the EMR it would appear that a critical success factor in attaining a population health management approach will be the evolving capability of the EMR for the identification, management and monitoring of individual patients and patient populations. This is also evident in the rise of population health management in the United States, where recent articles on population health management have appeared in information technology journals.<sup>251</sup> Judging from the interviews they were being used primarily for the monitoring and management of individual patients, although some physicians did acknowledge the greater potential for looking at groups of patients and case-

finding. This is supported by the recent results of the 2012 Commonwealth Fund survey of primary care physicians across Canada. While 79% of the Alberta physicians reported they were using EMRs, just 22% reported that they could easily generate a list of patients due for tests of preventive care.<sup>252</sup> However the fact that several physicians were able to provide estimates of the number of diabetics in their practices underscores the value of tools and programs such as the Diabetes Surveillance system. The fact that the Performance and Diligence Indicators project was stopped after the initial phase of roster verification was a setback. However the government moved during 2012 to introduce a new model of primary care called Family Care Clinics (FCCs) in order to provide access to Albertans not being served by PCNs.<sup>253</sup> Three pilot sites are presently in operation. The Health Minister has indicated that performance measures will be developed for the FCCs.<sup>254</sup> The FCC reference manual that has been circulated by the government includes a set of 10 performance measures that address issues such as access, patient satisfaction and the emphasis on health presentation and disease injury prevention. The manual also stipulates that FCCs will be required to conform to “primary health care standards”, and cites the primary care accreditation standard that has been developed by Accreditation Canada although it also suggests this will occur over the longer term.<sup>255</sup> Whether or not PCNs evolve into FCCs, these requirements are likely to be applied to them as well. The prospect of having to comply with standards underscores the importance of having a highly functional EMR. The April 1, 2013 tentative agreement between the AMA and Alberta Health includes a consultation agreement on PCNs that commits both parties to work toward an enhanced PCN program in Alberta (currently named PCN 2.0), including a common accountability framework and the identification and establishment of areas where standardization would be of benefit across all PCNs.<sup>256</sup>

A further challenge to the ability to manage the health of the panel population will lie in the ability to reach out to all patients and not just those who come in for appointments.

In summary, it is evident from the rich and detailed responses of the physicians that there is great potential for primary care physicians in PCNs to adopt a population health approach in their practices. Considering the four elements above they were probably the most advanced in health promotion and disease prevention. They were aware of the importance of health determinants such as SES, but much less familiar with tools and strategies to mitigate their affects. They were not very advanced in the area of inter-sectoral partnerships. With regard to population health management their experience with EMR seemed mainly limited to individual patient interactions, but some were starting down the road to think of their panels as a population.

Most recently, these four key elements are captured in a challenge set out by Thorlby to General Practice in the United Kingdom to “reclaim” a population health perspective. She sets out the characteristics for such a perspective as follows:

- “an interest in the health and well-being of local populations or communities;
- In addition to (but not instead of) a focus on individuals and family care by GP practices;
- Includes proactive, preventative care for healthy and chronically ill people;
- Includes a focus on the distribution of health within populations;
- It means proactive care for people attending regularly who are at risk of deteriorating health; and
- It means thinking about the health of people who are registers but not attending regularly.<sup>257(p7)</sup>

### *Pay-for-Performance*

Based on the discussion of P4P it is evident that there is a long way to go before one can begin to experiment with an incentive approach linked to population health outcomes as Kindig envisioned back in 1997.

What has become entrenched in practice in the United States and England over the past decade is P4P that is based on processes of care and intermediate outcomes such as blood pressure and glycemic control. While the English NHS has introduced PROMs for surgical procedures and is developing them for chronic diseases they have not yet made any prominent appearance in Canada. Interestingly, the 10 FCC pilot performance measures include (for clients diagnosed with chronic conditions) “the percent of FCC individuals maintaining or improving quality of life” and refers to the SF12 or EuroQoL – 5DF survey instruments.<sup>255</sup> All the physicians were able to define P4P, but in doing so, almost one in four critiqued it. When asked further if it would improve performance, just over half offered a discernible opinion, although among those who did the majority answered yes. However, virtually all the physicians identified at least one problematic issue with P4P. The most frequently cited issue was risk uncertainty, along the general theme of being held accountable for circumstances beyond one’s control such as patient compliance and the influence of non-medical determinants. Looking forward this will be a major challenge in Canada’s health care system.

General Practitioners in England have been dealing with capitation funding for decades, and as they are assuming greater control of health budgets are now being exposed to risk adjustment. Similarly the integrated insurance and delivery organizations in the US are long familiar with working in a capitated environment. Hence it will take considerable familiarization with concepts such as risk adjustment before P4P will be embraced, followed by a further stretch

before the emphasis will move from process to outcome and beyond that from a well-defined roster of patients to a geographic area.

If P4P is to be pursued one issue that will likely arise and that was raised by one physician is that as it has been implemented so far the emphasis has been rewarding the physician and yet the role of other team members in contributing to the achievement of P4P targets is essential (e.g. screening patients). This is something that has not been raised to any degree in the literature yet.

In light of the current international focus on improving health by reducing health inequalities, consideration might be given to linking P4P to targets associated with inequality reduction. This would require the inclusion of standardized SES and related measures such as Aboriginal status in the EMR. In a recent report a group in the Family Medicine Department of the University of Toronto acknowledges the challenges of measuring income in family practice and has proposed several approaches to capturing it.<sup>258</sup>

Based on the recent experience, which has seen the rise in population health management in the United States, it is clear that a change in the payment incentive structure, such as greater use of capitation that is integrated across the delivery system will be required before we will see a more aggressive pursuit of population health approaches in Canada.

The integrated delivery systems in the United States are funded through prepaid annual contracts whereby they are required to provide all the services that their insured population requires for that year. In Canada we continue to have silos of funding for hospital and home care, medical care and prescription drugs. While health Ministries do set annual budget targets, expenditures often exceed them. To date, there has been no incentive to reduce the incidence of health costs within silos other than the threat of consequences if the budget ceiling is exceeded,

and the silo funding mechanism prohibits sharing any savings across silos. Ontario's health Minister Deb Mathews has announced that she intends to move in the direction of primary care integration saying in early 2012 that "we will integrate family health care into the LHINs (Local Health Integration Network) ... we will identify a model that brings planning and accountability for the full patient journey under the LHINs)".<sup>259(p9)</sup> However, she also added that the Health Ministry will continue to hold the funding envelope for physicians. While several health Ministries across Canada have devolved the budget envelopes for hospital and community-based services to the health regions, physician and pharmaceutical budgets remain at the provincial level. There have been some proposals about devolving the physician services budget as well. For example the 2001 report of the Alberta Premier's Advisory Council on Health recommended that "a portion of the budget for physicians' services should be allocated to regional health authorities for contracting with physicians in the region", and an amount of 25% was suggested.<sup>260(p65)</sup> In a 2002 report on regionalizing health care budgets, the British Columbia Medical Association suggested that "regionalizing the MSP (Medical Service Plan) budget would be of grave concern to the physician community, raising questions of equity and access, professional autonomy and administrative action" and enumerated several concerns under each.<sup>261(p32)</sup> From the perspective of a publicly funded health care system, a fully integrated budget would be essential in order to align the incentives for population health improvement. Given that there has been even less discussion about regionalizing drug budgets this is unlikely to occur any time soon.

### ***Limitations and suggestions for future research***

One of the limitations of this study is that while there was significant variability among the physicians interviewed, on the whole they were leaders within the PCNs and within family

medicine which may limit generalizability. This is most evident in their use of the EMR. As noted previously all of the physicians were using an EMR. In comparison to the larger population in 2010 almost 4 in 10 Alberta family physicians were using an EMR,<sup>iv</sup> compared to just over 2 in 10 among all family physicians in Canada.<sup>212</sup>

Nonetheless when you consider that some 80% of family physicians in Alberta now participate in a PCN this likely represents a standard innovation curve and it is a question of time. A few of the physicians I interviewed would be considered innovators, and the rest would have been early adopters. Thus if Rogers' classic work on innovation diffusion applies they represent about 16% of the population.<sup>262</sup> However the uptake has been very rapid since the PCNs were launched in 2005. Nonetheless, it is useful to study the leaders since their experience and the issues they have identified provides useful information to guide further development of the PCN initiative, and to inform jurisdictions that have yet to embark on the implementation of new primary care delivery models.

Based on their comments, it was evident that all the physicians felt that their PCNs were successful. However this may not have been the case for all 31 PCNs. Reay et al. have reported on a three-year study of 8 PCNs with regard to their success in shifting to an interdisciplinary team approach. At the end of their study, they concluded that 5 out of the 8 PCNs were "surging ahead" with regard to adopting new practice models, while 2 remained in a "cautious planning" stage with little change and 1 was "mired in antagonism" with little interest in trying the new practices.<sup>263</sup>

Another limitation is that the interviews were confined to physicians. A more rounded perspective would undoubtedly have been attained had it been feasible (within the constraints of time) to interview other providers and PCN administrators. Reay et al.'s research has emphasized

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<sup>iv</sup> Defined as using electronic charts instead of patient charts.

the importance of managers in PCNs: “it was only in the sites where managers explicitly facilitated behaviour change that new practices were actually implemented and legitimized.” They noted further that the “mired in antagonism” PCN was the only one that had not hired a dedicated manager.

Moreover it must be emphasized that the PCN is just one of several new models of primary care delivery in Canada. These would include Ontario’s long-established Community Health Centres, the more recent Ontario Family Health Teams and Quebec’s Family Medicine Groups. These models also feature multidisciplinary teamwork and use a variety of funding and governance models.

With consideration to the recent literature on the shortcomings of the income-health relationship research in terms of the lack of attention to the underlying structural social and economic processes that provide inequalities, the conceptual framework was limited in that it only specified the two categories of socio-economic and behavioural determinants. In retrospect it would have been useful to have included a concept(s) of political and economic structure.

#### *Future research*

The findings of this research could be substantiated and enhanced with additional research.

First, the codes that have resulted from the interview data could be developed into a quantitative survey instrument that could be pilot-tested, refined and administered across PCNs and across the different primary care models that have emerged in other jurisdictions as well as across health professional groups.

Second, it would be useful to conduct similar qualitative interviews with PCN administrators and with other health care professionals providing services within PCNs. In fact,

such a step might be taken before developing the quantitative survey which could result in a more widely useable instrument.

Third, with the benefit of hindsight, it would likely have been useful to have shown the physicians the conceptual framework and to have asked the questions within the context. With the addition of additional concepts of political and economic structure it would be interesting to revisit the framework qualitatively. In fact there is simulation work underway in Canada on how the social determinants of health can be modeled that includes a broad array of stakeholders in its development.<sup>264</sup>

Fourth, give the continuing focus in health care on intermediate processes of care it would be useful to do qualitative research among physicians and other health professionals on their knowledge and attitudes with respect to health status and quality of life outcome measures.

### ***Conclusion***

In conclusion I believe that the foregoing has demonstrated that these family physicians practising in PCNs are adopting a population health approach and there is potential to extend further in this direction. As they described in the interviews they are starting to apply systematic prevention and screening methods through the EMR and the use of TOP practice guidelines. The strongest indication of further potential that emerged from the interviews is the acknowledgement of the importance of the social determinants of health, and that of SES in particular. The interviews suggest, however that there are or will be two critical success factors. The first of these is the absolute necessity of having a highly functional EMR to understand the characteristics of the patient panel, including social characteristics such as SES, to implement evidence-based prevention screening measures and to identify patients at risk of poor outcomes. Despite the fact that all physicians interviewed had been using EMRs for several years it was

evident that there was wide variability among them in their familiarity and expertise with the EMR. This undoubtedly raises implications for the inclusion of health informatics in medical education and postgraduate training. The second factor is the critical role of the multidisciplinary team. The physicians identified three key roles of team members: applying their unique skills to the delivery of patient care in the PCN (e.g. nursing, pharmacy, dietetics); mining the EMR and bringing patients in for prevention screening; and playing a role in addressing health inequalities. At the same time there was a clear sense that there is a greater demand for additional clinical and administrative support and this will entail a reexamination of the current funding model of the PCN. I would speculate that the significance of team collaboration will also have implications for undergraduate and postgraduate medical curricula with respect to the need for greater interprofessional education. As discussed previously the collaborator role in the CanMEDs framework recently adopted by the CFPC specifies key and enabling competencies that outline the role of the family physician in participating on collaborative team-based models of care and promoting a positive team working environment.<sup>168</sup>

Finally, taking into consideration the rapid growth of population health management in the United States, ultimately the incentive structure in PCNs and primary care more generally will have to change. It seems evident that the current conception of “pay-for-performance” is not proving to be effective. This is reflected both in the recent literature and in the many critical observations made by the physicians I interviewed. Aside from their specific criticisms they conveyed a sense that it undermines their professionalism. Reflecting back on Kindig’s original conception in 1997, he was proposing “pay at risk” rather than the extra or bonus payment that has subsequently been widely experimented with and which to date has only shown modest results. In fact in their 2011 Cochrane review, Scott et al. concluded that “there is insufficient

evidence to support or not support the use of incentives to improve the quality of primary health care.”<sup>265</sup> Moreover there remains the still uncharted territory of linking remuneration to health status outcomes, both in Canada and internationally, especially those outcomes for which no single individual or intervention can be considered entirely accountable, rather than intermediate process outcomes. In the primary care context it will be interesting to see how progress unfolds on PROMs in the area of chronic disease. The realignment of incentive structures to focus more on outcomes is actually a much more fundamental challenge in the Canadian health care system, although there are some early signs of a shift, such as Ontario’s 2010 *Excellent Care for All Act* that mandates a proportion of hospital executive compensation to be at risk in relation to the achievement of quality improvement targets.<sup>266</sup>

APPENDIX A

← E Q U I T Y →

Sample Abridged List of PHC Indicators		
Access to PHC Through a Regular Provider	Comprehensive Care, Preventive Health and Chronic Condition Management	Continuity Through Integration and Coordination
1. Population with a regular PHC provider 2. Difficulties accessing routine PHC*	12. Scope of PHC services 13. Health risk screening* 6. PHC client/patient registries for chronic conditions* 7. PHC programs for chronic conditions* 28. Client/patient participation in PHC treatment planning	80. Collaborative care with other health care organizations
<b>24/7 Access to PHC</b> 29. Difficulties obtaining urgent, non-emergent PHC on evenings and weekends 30. PHC after hours coverage 2. Difficulties accessing routine PHC*	<b>Patient-Centred PHC</b> 73. Client/patient satisfaction with PHC providers 78. Language barriers when communicating with PHC providers	<b>Enhancing Population Orientation</b> 6. PHC client/patient registries for chronic conditions* 7. PHC programs for chronic conditions* 10. Specialized PHC programs for vulnerable/special needs populations
<b>Quality in PHC</b>		
<b>Primary Prevention</b> 41. Influenza immunization, 65 + 50. Cervical cancer screening 13. Health risk screening*	<b>Patient Safety</b> 68. Use of medication alerts in PHC 63. Antidepressant medication monitoring	
<b>Secondary Prevention for Chronic Conditions</b> 55. Screening for modifiable risk factors in adults with coronary artery disease 56. Screening for modifiable risk factors in adults with hypertension 57. Screening for modifiable risk factors in adults with diabetes	<b>Treatment Goals and Outcomes</b> 39. Glycemic control for diabetes 40. Blood pressure control for hypertension 61. Treatment of dyslipidemia 35. Ambulatory care sensitive conditions 64. Treatment of depression	
<b>PHC Inputs and Supports</b>		
<b>Health Human Resources</b> 87. PHC organizations accepting new clients/patients	<b>Information Technology</b> 100. Uptake of information and communication technology in PHC organizations	
<b>Interdisciplinary Teams</b> 97. PHC FPs/GPs/NPs working in interdisciplinary teams/networks	<b>Allocations for PHC</b> 103. Average per capita PHC operational expenditures	
<b>Provider Payment Methods</b> 104. PHC provider remuneration method		

\*Indicators are repeated because it reflects multiple dimensions.

## APPENDIX B

## Alberta Primary Care Networks, 2009

<b>Region</b>	<b>Name of PCN</b>	<b>Number of Family Physicians</b>	<b>Number of Clinics/Sites</b>
Chinook	Chinook PCN	102	17 clinics
Palliser	Palliser PCN	52	28 clinics
Calgary	South Calgary PCN	113	25 clinics
	Calgary Rural PCN	88	23 clinics
	Highland PCN		
	Calgary West Central PCN	260	97 clinics
	Calgary Foothills PCN	171	62 clinics
	Mosaic PCN	62	31 clinics
	Bow Valley PCN	29	7 clinics
David Thompson	Big Country PCN	21	4 clinics
	Red Deer PCN	61	15 clinics
	Wolf Creek PCN	30	6 clinics
	Rocky Mountain House PCN	11	1 clinic
East Central	Provost/Consort PCN	4	1 clinic
	Camrose PCN	15	3 clinics
Capital	Edmonton North PCN	110	36 clinics
	Leduc Beaumont Devon PCN	44	12 clinics
	St. Albert and Sturgeon PCN	61	14 clinics
	Edmonton Oliver PCN	52	3 clinics
	Edmonton West PCN	65	18 clinics
	Edmonton Southside PCN	68	14 clinics
	Sherwood Park, Strathcona County PCN	53	19 clinics
		44	6 clinics
	West View PCN	55	8 clinics
Aspen	St. Paul/Aspen PCN	30	6 clinics
	Bonnyville PCN	15	1 clinic
Peace County	Sexsmith PCN	3	1 clinic
	Peace River	11	1 clinic
	West Peace PCN	5	2 clinics
Northern Lights	Northwest PCN	6	2 clinics
	Wood Buffalo PCN	27	13 clinics

## APPENDIX C

**Access to Selected Services by  
Practice Location and Size: Family Physicians, Canada, 2007**

**Background**

The National Physician Survey 2007 was a national census survey of physicians conducted by the College of Family Physicians of Canada, the Canadian Medical Association and the Royal College of Physicians and Surgeons of Canada.<sup>v</sup> Overall a 32% response rate was obtained. Physicians were asked to self report their practice location and setting. Practice setting included solo, group and interprofessional practice, the latter defined as “physicians and other health professionals who have their own caseloads.” Physicians were asked to assess the accessibility of 26 different services for their patients. Two that have been selected for comparison across practice locations and settings are access to other specialist physicians in general and psychosocial support services (e.g., psychologists and social workers). The results are shown in Table 1 below:

**Table 1**

**% of Family Physicians Reporting Excellent/Very Good Access to Selected  
Services for Patients, by Practice Location and Setting, Canada, 2007**

Service	Urban Setting		
	Solo	Group	Interprofessional
Other Specialists	22.5	22.5	29.6
Psychosocial Support	10	14.5	28.3
	Rural/Remote		
	Solo	Group	Interprofessional
Other Specialists	18.8	19.5	25.1
Psychosocial Support	19.9	18.3	31.2

Source: National Physician Survey, 2007

What Table 1 shows most clearly is that those physicians in interprofessional practice are more likely to report better access to other services than those physicians in either solo or group practice. There are few differences between the assessments of family physicians in urban

<sup>v</sup> Questionnaire, methods, details and results are posted at <http://www.nationalphysiciansurvey.ca/nps/2007nps-e.asp>

versus rural/remote areas. While the survey did not ask about practice size, it is almost certain that interprofessional practices would tend to be much larger than solo or group practices.

**APPENDIX D****Invitation Letter**

Dear Doctor (lead physician):

I am writing to ask for your assistance with my doctoral dissertation research in the Population Health Program at the University of Ottawa by participating in a face-to-face interview on *The Role of a Population Health Approach in Primary Care*. I estimate that this will require no more than one hour of your time, and I would be pleased to schedule it at a time of day most convenient for you. The interview will be conducted in English.

The concept of “population health” emerged in Canada in the 1990s. It has built on the work of the 1970s that focused on the lifestyle determinants of health, adding to it concepts such as social support and socio-economic determinants of health.

The purpose of my research is to examine attitudes and practices of primary care physicians with respect to the applicability of a population health perspective in primary care. This perspective will become increasingly important in health care in the years ahead.

I have selected Alberta’s Primary Care Networks (PCNs) as the site of my research on account of some of their unique features as compared to other new models of primary care in Canada. I hope to complete an interview with three physicians in each of eight PCNs that I have selected on the basis of size and urban/rural location. I am writing to the lead physician in each of these PCNs in the first instance. I hope that you might be agreeable to passing this request to two of your colleagues with an invitation to contact me if they are willing to be interviewed.

The responses to these interviews (subsequent to consent to record them) will be transcribed and analyzed, along with my interview notes, in aggregate format only. No one else will see any materials that connect your name with your responses. I will provide a copy of the interview questions in advance.

In closing, I would be most grateful for your cooperation, and hope that you will give favourable consideration to this request. I will follow up by telephone in a week’s time to see if you would be agreeable to an interview. In the meantime, if you have any questions, I may be reached at 1-800-663-7336-XXXX. Thank you very much.

Sincerely,

Owen Adams  
PhD Student  
Population Health Program

## APPENDIX E

**Draft Interview Guide**

Thank you for agreeing to speak with me. The focus of this interview is on “population health”, which is broadly concerned with the determinants of the level of health and its distribution in a population, as well as potential interventions to improve health and reduce inequalities.

I have just over a dozen open-ended questions. There are no right or wrong answers – I am only interested in your frank opinion. Your comments will only be analyzed and reported in aggregated format.

Before we begin I would like to clarify one definitional issue. In several of the questions I have used the phrase “practice population”. I would define this as the number of patients for which you have an active chart (i.e. they come in to see you at least occasionally). If you are in group practice you can answer either about your own roster of patients or the whole group practice of patients, whichever is easier.

1. Could you please briefly describe the population served by your practice (e.g., demographics, socio-economic status, health status)? Are you able to readily determine this from some form of database (e.g. electronic medical record)?
2. Roughly how many active patient charts does your practice have?
3. In a given year, what proportion of your patients with active charts comes to see you at least once?

*Primary Care in population health*

4. What does the term “population health” mean to you?
5. Thinking of your practice population and the surrounding community in which they live, what would you consider to be some of the determinants of their level of health?
6. How would you say that you as a primary care physician best contribute to the health of your practice population?

*Primary care and determinants of population health*

- 7 (a) Thinking back to what you outlined as the major determinants of health, what opportunities would you say that you as a primary care physician have to address them?
- (b) Can you provide any specific examples in which you feel you have been able to positively influence the determinants of health in your practice population?

- 8 (a) Thinking of your practice population of patients, would you say that there are subgroups whose level of health is below either what you would consider the norm for your practice or the surrounding community? If yes, what characterizes these subgroups?
- (b) What would you say are the underlying causes of these differences or inequalities?
- (c) What role would you say that you as a primary care physician might be able to play in reducing these differences or inequalities?

*The role of prevention and health promotion in primary care practice*

- 9 (a) One element of population health is an emphasis on health promotion/disease prevention. Thinking of your primary care practice, how would you describe the balance or relative emphasis between health promotion/disease prevention and the treatment of acute or chronic illness?
- (b) Is this more or less where you would like the balance/relative emphasis to be?
- (c) If not, can you suggest supports or other considerations that might enable you to achieve a better balance?
- (d) Looking ahead, do you foresee any potential ethical issues in resource allocation between programs that might, for example, target health promotion among disadvantaged groups versus improving access to diagnostic tests and treatments for your practice population as a whole?

*Enhancing the Role of Primary Care in Population Health*

10. Do you have the means to readily identify/summarize the health status characteristics of your practice population (e.g., number of patients with diabetes or other conditions)?
- 11 (a) The Canadian Institute for Health Information has developed a set of approximately 30 core indicators that might be compiled for primary care practice (attached). Looking at the schematic diagram, does it seem like a reasonable approach? What if anything might be missing?
- (b) How easy would it be to capture these indicators for your practice population?
- (c) What would you think about the use of some sort of health status outcome indicator that could be applied in your practice population?
- 12 (a) Are you familiar with the use of incentives such as “pay-for-performance”? Can you describe them as you understand them?
- (b) For you personally, do you think these would be effective in increasing levels of prevention and screening behaviour?

- (c) What might be the barriers in your practice to fully realizing such incentives?
- (d) What would you think about the use of an incentive approach that would be linked to health improvements based on an aggregate indicator of outcome measurement across your patient population regardless of whether or not patients have come to see you?

*Linkages to Other Sectors*

- 13 (a) What other health and social service agencies provide support to your practice population?
- (b) Do you have any established links or referral mechanisms with those agencies?
- (c) Are there any barriers that limit your ability to establish links with those agencies?
- 14 How has your practice used the capitated funding of an annual \$50.00 per patient?
- 15 (a) Do you have any linkages with the schools that serve your practice population?
- (b) To what extent do you think that schools have the potential to influence the health of your practice population?



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University of Ottawa  
Faculty of Graduate and  
Postdoctoral Studies

PhD in Population Health

1 rue Stewart, pièce 300  
Ottawa, ON K1N 6N5 Canada

Tél.: 613.562.5691  
Télééc.: 613.562.5112  
Courriel: [pop@uOttawa.ca](mailto:pop@uOttawa.ca)

1 Stewart Street, Room 300,  
Ottawa, ON K1N 6N5 Canada

Tel.: 613.562.5691  
Fax: 613.562.5112  
E-mail: [pop@uOttawa.ca](mailto:pop@uOttawa.ca)

[www.uOttawa.ca](http://www.uOttawa.ca)

## APPENDIX F

### Recruitment and Consent Form

#### Title of Project: A Population Health Framework: Assessing its Applicability in Primary Care

Dear Doctor:

I am writing to ask for your assistance with my doctoral dissertation research in the Population Health Program at the University of Ottawa by participating in a face-to-face interview on *the Role of a Population Health Approach in Primary Care*. I estimate that this will require no more than one hour of your time, and I would be pleased to schedule it at a time of day most convenient for you. The interview will be conducted in English.

The goal of this thesis research is to establish the potential and readiness for primary care physicians to adopt a population health approach, vis à vis their practice patient populations. The objectives are to: determine awareness and salience of the concepts of population health and social determinants of health among primary care physicians; assess the balance of preventive/promotion and acute treatment activities in practice; assess readiness to adopt tools and incentives toward applying a population health approach in primary care practice; and assess current and potential linkages between primary care and other sectors.

The expected benefit of this research in the medium term is that it will enhance family physicians' knowledge of population health management strategies in primary care practice.

Your participation in this project will involve participating in a face-to-face interview of approximately one hour in length. This interview will comprise some 15 questions that address the objectives set out above.

It is anticipated that your participation will not cause you any physical, emotional or psychological discomfort.

Your comments will be captured through notes and digital recording (should you consent) and you will be provided with a copy of your comments to ensure that your thoughts have been accurately captured. You may withdraw from the study at any time.

Please be assured that all your information will be kept strictly confidential. The research results will reflect the highest level of anonymity. Comments will not be attributed to individuals. Throughout the study only a numerical identification will be used, and only the researcher will be able to link individuals to those numbers. Furthermore, names of participants will not be recorded on interviews.

All data collected will be kept in a secure, locked filing cabinet and will only be accessed by the researcher (Owen Adams) or thesis supervisor (Douglas Angus). The data collected will be destroyed five years from the date that the dissertation is defended. This includes all field notes and electronic transcriptions, related electronic files and paper copies thereof.

Your participation is voluntary and you may withdraw at any time and/or refuse to answer certain questions without having to provide justification. If you do withdraw from the study, all data that you have contributed will be destroyed, unless you indicate otherwise.

### **Acceptance**

I have read and understood the contents of this consent form, and I have had the opportunity to discuss its contents and to ask questions. I voluntarily agree to participate in this study (please write yes or no below as appropriate).

\_\_\_\_\_ I agree to be interviewed for the purpose of this study.

\_\_\_\_\_ I consent to the interview being digitally recorded.

.....  
Participant's Name    Signature of Participant    Date

For any additional information regarding this study, you may contact the Co-Investigator, PhD candidate Owen Adams, Population Health Program, University of Ottawa. Telephone 1-800-663-7336-XXXX, email: XXXX.

The supervisor of this dissertation research is Professor Douglas E. Angus, Telfer School of Management, University of Ottawa, Telephone 613-562-5800, extension XXXX, email; XXXX.

For information related to the ethics of this research study, you may communicate with the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland, Room 159, Ottawa, Ontario, Canada, K1N 6N5, Tel: (613) 562-XXXX, email: XXXX. There are two copies of this consent form. You may keep one copy for yourself.

.....  
Researcher's Name    Signature of Researcher    Date

**APPENDIX G**

**Certificate of Ethics Approval – Health Sciences and Science REB**

**University of Ottawa**

A copy of the Certificate of Ethics Approval, File #H10-09-12 is lodged the Research Grants and Ethics Services, University of Ottawa.

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- <sup>1</sup> Kindig D, Stoddart G. What is population health? *American Journal of Public Health* 2003;93(3):380-83.
- <sup>2</sup> Evans R, Stoddart G. Producing health, consuming health care. *Social Science and Medicine* 1990;31(12):1347-63.
- <sup>3</sup> Evans R, Barer M, Marmor T (eds.) *Why are some people healthy and others not?* New York: Aldine De Gruyter, 1994.
- <sup>4</sup> Virchow R. Report on the Typhus epidemic in Upper Silesia. Translation republished in *Social Medicine* 2006;1(1):83-98.
- <sup>5</sup> Marsh L, Fleming A, Blackler C. *Health and unemployment: some studies of their relationships*. Toronto: Oxford University Press, 1938.
- <sup>6</sup> Marsh L. *Report on social security for Canada*. Ottawa: King's Printer, 1943.
- <sup>7</sup> Brenner M. *Mental illness and the economy*. Cambridge, Mass.: Harvard University Press, 1973.
- <sup>8</sup> Surgeon General's Advisory Committee on Smoking and Health. *Smoking and health*. Washington: U.S. Department of Health, Education and Welfare, 1964.
- <sup>9</sup> McKeown T, Brown R. Medical evidence related to English population changes in the eighteenth century. *Population Studies* 1955;9(2):119-41.
- <sup>10</sup> McKeown T, Record R. Reasons for the decline of mortality in England and Wales during the nineteenth century. *Population Studies* 1962;16(2):94-122.
- <sup>11</sup> McKeown T, Record R, Turner R. An interpretation of the decline of mortality in England and Wales during the twentieth century. *Population Studies* 1975;29(3):391-422.
- <sup>12</sup> McKeown T. Man's health: the past and the future. *West J Med* 1980;132(Jan):49-57.
- <sup>13</sup> McKinlay J, McKinlay S. The questionable contribution of medical measures to the decline of mortality in the United States in the twentieth century. *Milbank Mem Fund Q Health Soc*. 1977;55(3):405-28.
- <sup>14</sup> Selye H. Forty years of stress research: principal remaining problems and misconceptions. *CMAJ* 1976;115(1):53-6.
- <sup>15</sup> Cassel J. The contribution of the social environment to host resistance. *American Journal of Epidemiology* 1976;104(2):107-23.
- <sup>16</sup> Laframboise H. Health policy: breaking the problem down into more manageable segments. *C.M.A. Journal* 1973;108(February 3):388-93.
- <sup>17</sup> Lalonde M. *A new perspective on the health of Canadians: a working document*. April 1974. Ottawa: Minister of Supply and Services, 1981.
- <sup>18</sup> World Health Organization. *Declaration of Alma Ata*. 1978.  
[www.who.int/hpr/NPH/docs/declaration\\_almaata.pdf](http://www.who.int/hpr/NPH/docs/declaration_almaata.pdf). Accessed 01/06/12.
- <sup>19</sup> Passmore R. The Declaration of Alma-Ata and the future of primary care. *Lancet* 1979;314(8150):1005-8.
- <sup>20</sup> Illich I. *Medical nemesis: the expropriation of health*. London:Calder & Boyars Ltd., 1975.
- <sup>21</sup> Illich I. Medicalization and primary care. *Journal of the Royal College of General Practitioners* 1982;32(August):463-70.
- <sup>22</sup> Ehrenreich B, English D. *Complaints & disorders: the sexual politics of sickness*. New York: Feminist Press,, 1973.
- <sup>23</sup> Riessman C. Women and medicalization: a new perspective. *Social Policy* 1983;14(1):3-18.
- <sup>24</sup> Ehrenreich B, English D. *For her own good: two centuries of the experts' advice to women*. New York: Anchor Books, 2005.
- <sup>25</sup> Relman A. The new medical-industrial complex. *NEJM* 1980;303(17):963-70.
- <sup>26</sup> Townsend P, Davidson N. *Inequalities in health: the Black Report*. Harmondsworth UK: Penguin Books Ltd., 1982.
- <sup>27</sup> McKinlay J. A case for refocussing upstream: the political economy of illness. Pp. 9-25 in Jaco E (ed.) *Patients, physicians and illness*. New York: Free Press, 1979.
- <sup>28</sup> Hilgerson L, Prohaska T. Hospital health promotion: swimming or sinking in an upstream business? *Health Promotion Practice* 2003;4(1):56-63.

- 
- <sup>29</sup> World Health Organization. *Ottawa Charter for Health Promotion*. 1986. [www.who.int/hpr/NPH/docs/ottawa\\_charter\\_hp.pdf](http://www.who.int/hpr/NPH/docs/ottawa_charter_hp.pdf). Accessed 01/06/12.
- <sup>30</sup> Health and Welfare Canada. *Achieving health for all: a framework for health promotion*. 1986. [www.hc-sc.gc.ca/hcs-sss/pubs/system-regime/1986-frame-plan-promotion/index\\_e.html](http://www.hc-sc.gc.ca/hcs-sss/pubs/system-regime/1986-frame-plan-promotion/index_e.html). Accessed 01/06/12.
- <sup>31</sup> Canadian Hospital Association. *Reply to Achieving All: A Framework for Health Promotion*. Ottawa: 1988.
- <sup>32</sup> Canadian Medical Association. Joint Subcommittee on Health Promotion. *CMA's response to "Achieving health for all"*. Memorandum April 22, 1988.
- <sup>33</sup> Rafferty M. Prevention services in primary care: taking time, setting priorities. *West J Med* 1998;169:269-75.
- <sup>34</sup> Yarnall K, Pollak K, Ostbye T, Krause K, Michener L. Primary care: is there time enough for prevention? *American Journal of Public Health* 2003;93(4):635-41.
- <sup>35</sup> Canadian Institute for Health Information. *National health expenditure trends, 1975 to 2012*. Ottawa, 2012.
- <sup>36</sup> Ontario Premier's Council on Health Strategy. *Nurturing health: a framework on the determinants of health*. Toronto, 1991.
- <sup>37</sup> Ministère de la Santé et des Services Sociaux. *The policy on health and well-being*. Québec, 1992.
- <sup>38</sup> Simard L. *A Saskatchewan vision for health*. Regina:Saskatchewan Health, 1992.
- <sup>39</sup> James A. Closing rural hospitals in Saskatchewan: on the road to wellness? *Social Science & Medicine* 1999;49(8):1021-34.
- <sup>40</sup> Liberal Party of Canada. *Creating opportunity: the Liberal plan for Canada*. Ottawa, 1993.
- <sup>41</sup> Federal, Provincial and Territorial Advisory Committee on Population Health. *Strategies for Population Health: Investing in the Health of Canadians*. Ottawa: Minister of Supply and Services Canada, 1994.
- <sup>42</sup> Public Health Agency of Canada. *What determines health?* <http://www.phac-aspc.gc.ca/ph-sp/determinants/index-eng.php#determinants>. Accessed 01/06/12.
- <sup>43</sup> Hancock T. Lalonde and beyond: looking back at "A new perspective on the health of Canadians". *Health Promotion* 1986;1(1):93-100.
- <sup>44</sup> Pettersson B. Transforming Ottawa Charter health promotion concepts into Swedish public health policy. *Promotion & Education* 2006;XIV(4):244-9.
- <sup>45</sup> Hogstedt C, Lundgren B, Moberg H, Pettersson B, Agren G. Chapter 2: the Public Health Objective Bill (Govt. Bill 2002/03:35)-Extended summary. *Scand J Public Health* 2004;32(Suppl 64):18-59.
- <sup>46</sup> Ministry of Social Affairs and Health. *National action plan to reduce health inequalities 2008-2011*. <http://pre20090115.stm.fi/pr1227003636140/passthru.pdf>. Accessed 01/06/12.
- <sup>47</sup> Norwegian Ministry of Health and Care Services. *National strategy to reduce social inequalities in health*. <http://pre20090115.stm.fi/pr1227003636140/passthru.pdf>. Accessed 01/06/12.
- <sup>48</sup> Saskatchewan Health. *A population health promotion framework for Saskatchewan Health Authorities*. <http://www.health.gov.sk.ca/health-promotion-framework>. Accessed 01/06/12.
- <sup>49</sup> Health Canada. *The population health template: key elements and actions that define a population health approach*. July 2001 draft. <http://www.phac-aspc.gc.ca/ph-sp/pdf/discussion-eng.pdf>. Accessed 01/28/13.
- <sup>50</sup> Public Health Agency of Canada. *Implementing the population health approach*. [http://www.phac-aspc.gc.ca/ph-sp/implement/index-eng.php#imp\\_strategies](http://www.phac-aspc.gc.ca/ph-sp/implement/index-eng.php#imp_strategies). Accessed 01/06/12.
- <sup>51</sup> O'Hara P. *Creating social and health equity: adopting an Alberta social determinants of health framework*. [http://edmontonsocialplanning.ca/images/stories/pdf/sdoh\\_discussion\\_paper.pdf](http://edmontonsocialplanning.ca/images/stories/pdf/sdoh_discussion_paper.pdf). Accessed 01/06/12.
- <sup>52</sup> Canadian Medical Association. *Strengthening the foundation: the role of the physician in primary health care in Canada*. Ottawa, 1994.
- <sup>53</sup> Health Canada. *About primary care*. <http://www.hc-sc.gc.ca/hcs-sss/prim/about-afpropos-eng.php>. Accessed 01/07/12.
- <sup>54</sup> Enhancing Interdisciplinary Collaboration in Primary Health Care. *The principles and framework for interdisciplinary collaboration in primary health care*. <http://www.eicp.ca/en/principles/march/EICP-Principles-and-Framework-March.pdf>. Accessed 01/07/12.
- <sup>55</sup> Federal/Provincial/Territorial Advisory Committee on Health Services. *The Victoria report on physician remuneration*. Ottawa, 1995.
- <sup>56</sup> Health Canada. *About the Health Transition Fund*. <http://www.hc-sc.gc.ca/hcs-sss/ehealth-esante/infostructure/finance/htf-fass/about-afpropos/index-eng.php>. Accessed 01/29/13.
- <sup>57</sup> Mable A, Marriott J. *Sharing the learning: Health Transition fund: synthesis series: primary health care*. <http://www.hc-sc.gc.ca/hcs-sss/pubs/acces/2002-htf-fass-prim/index-eng.php>. Accessed 01/29/13.
- <sup>58</sup> Canadian Intergovernmental Conference Secretariat. *First Ministers' communiqué on health*. <http://www.scics.gc.ca/english/conferences.asp?a=viewdocument&id=1144>. Accessed 01/29/13.

- <sup>59</sup> Health Canada. *Primary Health Care Transition Fund*. [http://www.hc-sc.gc.ca/hcs-sss/alt\\_formats/hpb-dgps/pdf/phctf-fassp-pamph-depl-eng.pdf](http://www.hc-sc.gc.ca/hcs-sss/alt_formats/hpb-dgps/pdf/phctf-fassp-pamph-depl-eng.pdf). Accessed 01/29/13.
- <sup>60</sup> Canadian Intergovernmental Conference Secretariat. *2003 First Ministers' Accord on Health Care Renewal*. [http://www.scics.gc.ca/CMFiles/800039004\\_e1GTC-352011-6102.pdf](http://www.scics.gc.ca/CMFiles/800039004_e1GTC-352011-6102.pdf). Accessed 01/29/13.
- <sup>61</sup> Hutchison B, Levesque J, Strumpf E, Coyle N. Primary health care in Canada : systems in motion. *Milbank Quarterly* 2011;89(2):256-88.
- <sup>62</sup> Conference Board of Canada. *Improving primary health care through collaboration – briefing 1 – current knowledge about interprofessional teams in Canada*. Ottawa, 2012.
- <sup>63</sup> Conference Board of Canada. *Improving primary health care through collaboration: briefing 2 – barriers to successful interprofessional teams*. Ottawa, 2012.
- <sup>64</sup> Or Z. *Exploring the effects of health care on mortality across OECD countries*. Labour Market and Social Policy – Occasional Papers No. 46. Paris: Organization for Economic Cooperation and Development, 2001.
- <sup>65</sup> Or Z, Wang J, Jamison D. International differences in the impact of doctors on health: a multilevel analysis of OECD countries. *Journal of Health Economics* 2005;24(3):531-60.
- <sup>66</sup> Arah O, Westert G, Delnoij D, Klazinga N. Health system outcomes and determinants amenable to public health in industrialized countries: a pooled, cross-sectional time series analysis. *BMC Public Health* 2005, 5:81 doi:10.1186/1471-2458-5-81. Accessed 01/07/12.
- <sup>67</sup> Gulliford M. Availability of primary care doctors and population health in England: is there an association? *Journal of Public Health Medicine* 2002;24(4):252-4.
- <sup>68</sup> Gulliford M, Jack R, Adams G, Ukomunne O. Availability and structure of primary medical care services and population health and health care indicators in England. *BMC Health Services Research* 2004;4:12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC446205/pdf/1472-6963-4-12.pdf>. Accessed 01/07/12.
- <sup>69</sup> Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Quarterly* 2005;83(3):457-502.
- <sup>70</sup> Macinko J, Starfield B, Shi L. Quantifying the health benefits of primary care physician supply in the United States. *International Journal of Health Services* 2007;37(1):111-26.
- <sup>71</sup> Macinko J, Starfield B, Shi L. The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998. *Health Services Research* 2003;38(3):831-65.
- <sup>72</sup> Chang C, Stukel T, Flood A, Goodman D. Primary care physician workforce and Medicare beneficiaries' health outcomes. *JAMA* 2011;305(20):2096-2105.
- <sup>73</sup> Basu J, Friedman B, Burstin H. Primary care, HMO enrollment, and hospitalization for ambulatory care sensitive conditions. *Medical Care* 2002;40(12):1260-9.
- <sup>74</sup> Macinko J, Oliveira V, Turci M, Guanais F, Bonolo P. The influence of primary care and hospital supply on ambulatory care-sensitive hospitalizations among adults in Brazil, 1999-2007. *American Journal of Public Health* 2011;101(10):1963-70.
- <sup>75</sup> Watson D, McGrail K. More doctors or better care? *Healthcare Policy* 2009;5(1):26-31.
- <sup>76</sup> Sundmacher L, Busse R. The impact of physician supply on avoidable cancer deaths in Germany: a spatial analysis. *Health Policy* 2011;103:53-62.
- <sup>77</sup> U.S. Department of Health and Human Services. *Healthy People 2020*. [http://healthypeople.gov/2020/TopicsObjectives2020/pdfs/HP2020\\_brochure.pdf](http://healthypeople.gov/2020/TopicsObjectives2020/pdfs/HP2020_brochure.pdf). Accessed 01/07/12.
- <sup>78</sup> Cutler D, Rosen A, Vijan S. The value of medical spending in the United States, 1960-2000. *N ENGL J MED* 2006;355(9):920-7.
- <sup>79</sup> Bunker J. Medicine matters after all. *Journal of the Royal College of Physicians of London* 1995;29(2):105-12.
- <sup>80</sup> University of Wisconsin Population Health Institute. *County health rankings – our approach*. <http://countyhealthrankings.org/out-approach>. Accessed 08/29/13.
- <sup>81</sup> Standing Senate Committee on Social Affairs Science and Technology: Subcommittee on Population Health. *A healthy, productive Canada: a determinant of health approach*. <http://www.parl.gc.ca/Content/SEN/Committee/402/popu/rep/rephealth1jun09-e.pdf>. Accessed 11/04/12.
- <sup>82</sup> Canadian Task Force on Preventive Health Care. *History of the Task Force*. [http://www.canadiantaskforce.ca/history\\_eng.html](http://www.canadiantaskforce.ca/history_eng.html). Accessed 01/07/12.
- <sup>83</sup> Canadian Agency for Drugs and Technologies in Health. *About CADTH*. [www.cadth.ca/index.php/en/cadth](http://www.cadth.ca/index.php/en/cadth). Accessed 01/07/12.

- <sup>84</sup> Department of Health. *Health equity audit: a self-assessment tool*. [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4070715?IdcService=GET\\_FILE&dID=18883&Rendition=Web](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4070715?IdcService=GET_FILE&dID=18883&Rendition=Web). Accessed 01/07/12.
- <sup>85</sup> Aspinall P, Jacobson B. Managing health inequalities locally: a baseline survey of primary care trusts' experience with health equity audit in the implementation year. *Health Services Management Research* 2005;18(4):223-31.
- <sup>86</sup> Health Providers Against Poverty. *Poverty: a clinical tool for primary care in Ontario*. <http://www.healthprovidersagainstopoverty.ca/system/files/Poverty-%20A%20Clinical%20Tool%20for%20Primary%20Care%20%282012%29.pdf>. Accessed 01/30/13.
- <sup>87</sup> Health Providers Against Poverty. *Take care of your income*. <http://www.healthprovidersagainstopoverty.ca/system/files/Poverty-%20A%20Resources%20for%20Patients%20%282012%29.pdf>. Accessed 01/30/13.
- <sup>88</sup> Neuwelt P, Matheson D, Arroll B, Dowell A, Winnard D, Crampton P, Sheridan N, Cumming J. Putting population health into practice through primary health care. *New Zealand Medical Journal* 2009;122(1290):98-104.
- <sup>89</sup> Zenzano T, Allan J, Bigley M et al. The roles of healthcare professionals in implementing clinical prevention and population health. *American Journal of Preventive Medicine* 2011;40(2):261-7.
- <sup>90</sup> Royal College of Physicians. *How doctors can close the gap. Tackling the social determinants of health through culture change, advocacy and education*. <http://old.rcplondon.ac.uk/professional-Issues/Public-Health/Documents/RCP-report-how-doctors-can-close-the-gap.pdf>. Accessed 01/07/12.
- <sup>91</sup> British Medical Association. *Social determinants of health - what doctors can do*. <http://bma.org.uk/-/media/Files/PDFs/Working%20for%20change/improving%20health/socialdeterminantshhealth.pdf>. Accessed 01/30/13.
- <sup>92</sup> Neudorf C. Integrating a population health approach into healthcare service delivery and decision making. *Healthcare Management Forum* 2012;25(3):155-9.
- <sup>93</sup> World Bank. *World development report 1993: investing in health*; London: Oxford University Press, 1993.
- <sup>94</sup> World Health Organization. *World health report 2000*. Geneva, 2000.
- <sup>95</sup> McKee M. The world health report 2000: 10 years on. *Health Policy and Planning* 2010;25(5):346-8.
- <sup>96</sup> Eisen B, Bjornberg A. *Euro-Canada health consumer index 2010*. <http://www.fcpp.org/files/1/ECHCI2010%20Final.pdf>. Accessed 01/30/13.
- <sup>97</sup> McDonald L. Florence Nightingale and the early origins of evidence-based nursing. *Evid Based Nurs*. 2001;4(3):68-9.
- <sup>98</sup> Donabedian A. The end results of health care: Ernest Codman's contribution to quality assessment and beyond. *Milbank Quarterly* 1989;67(2):233-56.
- <sup>99</sup> Donabedian A. Evaluating the quality of medical care. *Milbank Memorial Fund Quarterly* 1966;44(3)Pt.2:166-203.
- <sup>100</sup> MacKenzie T, Greenaway-Coates A, Djurfeldt M. *Outcomes Monitoring Project: Executive Summary*. Ottawa: Canadian Council on Health Facilities Accreditation, 1992.
- <sup>101</sup> Canadian Institute for Health Information. *Hospital report 2002*. Ottawa, 2002.
- <sup>102</sup> Health and Welfare Canada, Statistics Canada. *The health of Canadians: report of the Canada Health Survey*. Catalogue 82-538E. Ottawa, Minister of Supply and Services Canada, 1981.
- <sup>103</sup> Ware J. *SF-36® health survey update*. <http://www.sf-36.org/tools/sf36.shtml>. Accessed 01/07/12.
- <sup>104</sup> See Health Utilities Inc. [www.healthutilities.com/manual.htm](http://www.healthutilities.com/manual.htm) 01/07/12.
- <sup>105</sup> Wilkins R, Adams O. *Healthfulness of Life*. Montreal: Institute for Research on Public Policy, 1983.
- <sup>106</sup> REVES. *International Network on Health Expectancy and the Disability Process*. <http://reves.site.ined.fr/en>. Accessed 01/07/12.
- <sup>107</sup> Rachlis M, Kushner C. *Second opinion: what's wrong with Canada's health care system and how to fix it*. Toronto: Collins Publishers, 1989.
- <sup>108</sup> Managed Care On-Line. *Managed care fact sheets. National HMO enrollment*. <http://www.mcareol.com/factshts/factnati.htm>. Accessed 01/07/12.
- <sup>109</sup> McIntosh T, Ducie M, Burka-Charles M, Church J, Lavis J, Pomey M, Smith N, Tomblin S. Population health and health system reform: needs-based funding for health services in five provinces. *Canadian Political Science Review* 2010;4(1):42-61.
- <sup>110</sup> Epstein A. Pay for performance at the tipping point. *N Engl J Med* 2007;356(5):515-7.
- <sup>111</sup> The Information Centre. *National Quality and Outcomes Framework Statistics for England 2006-07*. [www.ic.nhs.uk/webfiles/QOF/2006-07/QOF%202006-07%20Statistical%20Bulletin.pdf](http://www.ic.nhs.uk/webfiles/QOF/2006-07/QOF%202006-07%20Statistical%20Bulletin.pdf) Accessed 01/07/12.

- <sup>112</sup> Checkland K, Harrison S, McDonald R, Grant S, Campbell S, Guthrie B. Biomedicine, holism and general practice: response to the 2004 General Practitioner contract. *Sociology of Health and Illness* 2008;30(5):788-803.
- <sup>113</sup> eHealthinsider. *English practices earn £119,000 a year from QoF*, 28 Sep 2007. [http://www.ehiprimarycare.com/News/3073/english\\_practices\\_earn\\_%C3%82%C2%A3119,000\\_a\\_year\\_from\\_qof](http://www.ehiprimarycare.com/News/3073/english_practices_earn_%C3%82%C2%A3119,000_a_year_from_qof). Accessed 01/07/12.
- <sup>114</sup> NHS Information Centre for Health and Social Care. *General and personal medical services, England 1998-2008*. <http://www.ic.nhs.uk/webfiles/publications/nhsstaff2008/gp/Bulletin%20Sept%202008.pdf>. Accessed 01/07/12.
- <sup>115</sup> Campbell S, Reeves D, Kontopantelis E, Middleton E, Sibbald B, Roland M. Quality of primary care in England with the introduction of pay for performance. *N Engl J Med* 2007;357(2):181-90.
- <sup>116</sup> National Audit Office. *NHS Pay Modernisation: New Contracts for General Practice Services in England*. [www.nao.org.uk/publications/nao\\_reports/07-08/0708307.pdf](http://www.nao.org.uk/publications/nao_reports/07-08/0708307.pdf) Accessed 01/07/12.
- <sup>117</sup> Doran T, Kontopantelis E, Valderas J. Effect of financial incentives on incentivized and non-incentivized clinical activities: longitudinal analysis of data from the UK Quality and Outcomes Framework. *BMJ* 2011;342:d3590 doi: 10.1136/bmj.d3590. Accessed 01/08/12.
- <sup>118</sup> Fleetcroft R, Cookson R. Do the incentive payments in the new NHS contract for primary care reflect likely population health gains? *J Health Serv Res Policy* 2006;11(1):27-31.
- <sup>119</sup> Doran T, Fullwood K, Kontopantelis E, Reeves D. The effect of financial incentives on inequalities in the delivery of primary care in England. *Lancet* 2008;372:728-36.
- <sup>120</sup> Campbell S, McDonald R, Lester H. The experience of pay for performance in English family practice: a qualitative study. *Annals of Family Medicine* 2008;6(3):228-34.
- <sup>121</sup> Hurley J, DeCicca P, Li J, Buckley G. *The response of Ontario primary care physicians to pay-for-performance incentives*. April 21, 2011. CHEPA Working Paper Series Paper 11-02. <http://www.chepa.org/docs/working-papers/11-02.pdf?sfvrsn=2>. Accessed 10/07/12.
- <sup>122</sup> Kiran T, Victor J, Kopp A, Shah B, Glazier R. The relationship between financial incentives and quality of diabetes care in Ontario, Canada. *Diabetes Care* 2012;35(5):1038-46.
- <sup>123</sup> British Columbia Medical association, British Columbia Ministry of Health, Society of General Practitioners. *GP Services Committee incentives. Billing workbook*. Revised January 2012. [http://www.gpsc.bc.ca/system/files/GPSC\\_Billing\\_Workbook\\_January\\_2012\\_0.pdf](http://www.gpsc.bc.ca/system/files/GPSC_Billing_Workbook_January_2012_0.pdf). Accessed 10/07/12.
- <sup>124</sup> Hux J, Melady M, DeBoer D. Confidential prescriber feedback and education to improve antibiotic use in primary care: a controlled trial. *CMAJ* 1999;161:388-92.
- <sup>125</sup> Robert Wood Johnson Foundation. *Rewarding results pay-for-performance initiative: ten lessons learned*. November 15, 2005. [http://www.rwjf.org/files/newsroom/RewardingResultsLessons\\_110705.pdf](http://www.rwjf.org/files/newsroom/RewardingResultsLessons_110705.pdf) . Accessed 01/08/12..
- <sup>126</sup> EQ-5D (EuroQal) is a 16 item standardized instrument for use as a measure of health outcome. See [www.euroqol.org](http://www.euroqol.org). Accessed 01/08/12.
- <sup>127</sup> Appleby J, Devlin N. *Measuring NHS success*. London: Kings Fund, 2005.
- <sup>128</sup> VF-14 (Visual Function) is a health survey questionnaire designed for ophthalmology with 14 main questions.
- <sup>129</sup> British United Provident Association. *Taking care of the lives in our hands*. [http://www.bupa.com.cn/pdfs/bupa/bupa\\_corporate\\_brochure.pdf](http://www.bupa.com.cn/pdfs/bupa/bupa_corporate_brochure.pdf). Accessed 01/08/12.
- <sup>130</sup> Office of Health Economics. *Report of the Office of Health Economics Commission on NHS Outcomes, Performance and Productivity* <http://www.ohe.org/object/download.cfm?lib=liPublication&id=190>. Accessed 01/08/12.
- <sup>131</sup> Kirwan J, Tugwell P. Overview of the patient perspective at OMERACT 10 – conceptualizing methods for developing patient-reported outcomes. *Journal of Rheumatology* 2011;38(8):1699-701.
- <sup>132</sup> Department of Health. *Guidance on the routine collection of Patient Reported Outcome Measures (PROMs)*. [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_092625.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_092625.pdf). Accessed 01/08/12.
- <sup>133</sup> See <http://www.ic.nhs.uk/proms>. Accessed 01/08/12.
- <sup>134</sup> Department of Public Health. Oxford University. *PROMs Background*. <http://www.publichealth.ox.ac.uk/research/hsru/promspilot/promsbackground/?searchterm=PROMs>. Accessed 01/08/12.
- <sup>135</sup> Department of Health. *The NHS Outcomes Framework 2011/12*. [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/documents/digitalasset/dh\\_123138.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_123138.pdf). Accessed 01/08/12.

- <sup>136</sup> Department of Health. *The GP Patient Survey*. See <http://www.gp-patient.co.uk>. Accessed 01/08/12.
- <sup>137</sup> Kindig D. *Purchasing population health: paying for results*. Ann Arbor: University of Michigan Press, 1997.
- <sup>138</sup> Kindig D. Managing population health. *Physician Executive* 1997;23(7):34-9.
- <sup>139</sup> Pronk N, O'Connor P. Systems approach to population health improvement. *Journal of Ambulatory Care Management* 1997;20(4):24-31.
- <sup>140</sup> Pronk S. Population health improvement-the next era of the health care management evolution. *Benefits Quarterly* 2005;21(3):12-6.
- <sup>141</sup> Kindig D. A pay-for-population health performance system. *JAMA* 2006;296(21):2611-3.
- <sup>142</sup> Kindig D. Understanding population health terminology. *Milbank Quarterly* 2007;85(1):139-61.
- <sup>143</sup> Hillman M. *Testimony before the Subcommittee on Health of the House Committee on Ways and Means Hearing on Promoting Disease Management in Medicare*. April 16, 2002. <http://waysandmeans.house.gov/legacy/health/107cong/4-16-02/4-16hill.htm>. Accessed 09/02/12.
- <sup>144</sup> Felt-Lisk S, Higgins T. *Exploring the promise of population health management programs to improve health*. Mathematica Policy Research Issue Brief. August 2011. [http://www.mathematica-mpr.com/publications/PDFs/health/PHM\\_brief.pdf](http://www.mathematica-mpr.com/publications/PDFs/health/PHM_brief.pdf). Accessed 10/07/12.
- <sup>145</sup> Cusack C, Knudson A, Kronstadt J, Singer R, Brown A. *Practice-based population health: information technology to support transformation to proactive primary care*. Agency for Healthcare Research and Quality Publication No. 10-0092-EF. July 2010. [http://pcmh.ahrq.gov/portal/server.pt/gateway/PTARGS\\_0\\_12547\\_955656\\_0\\_0\\_18/Information%20Technology%20to%20Support%20Transformation%20to%20Proactive%20Primary%20Care.pdf](http://pcmh.ahrq.gov/portal/server.pt/gateway/PTARGS_0_12547_955656_0_0_18/Information%20Technology%20to%20Support%20Transformation%20to%20Proactive%20Primary%20Care.pdf). Accessed 10/07/12.
- <sup>146</sup> Institute for Healthcare Improvement. *IHI Triple Aim Initiative*. <http://www.ihf.org/offering/Initiatives/TripleAim/Pages/default.aspx>. Accessed 09/03/12.
- <sup>147</sup> U.S. House of Representatives. *Compilation of Patient Protection and Affordable Care Act*. <http://housedocs.house.gov/energycommerce/ppacacon.pdf>. Accessed 10/07/12.
- <sup>148</sup> Centers for Medicare & Medicaid Services. *Guide to quality performance standards for Accountable Care Organizations starting in 2012: pay for reporting and pay for performance*. <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/ACO-Guide-Quality-Performance-2012.PDF>. Accessed 10/07/12.
- <sup>149</sup> Hodach R. *ACOs and population health management: how physician practices must change to manage patient populations effectively*. [http://www.amga.org/AboutAMGA/ACO/Articles/CaseStudy\\_final.pdf](http://www.amga.org/AboutAMGA/ACO/Articles/CaseStudy_final.pdf). Accessed 10/07/12.
- <sup>150</sup> Blumenthal D, Tavenner M. The “meaningful use” regulation for electronic health records. *N Engl J Med* 2010;363(6):501-4.
- <sup>151</sup> PHYTEL. *Meaningful use and the path to population health and quality in a transforming healthcare system*. [http://info.phytel.com/rs/phytel/images/meaningful\\_use\\_final.pdf](http://info.phytel.com/rs/phytel/images/meaningful_use_final.pdf). Accessed 10/07/12.
- <sup>152</sup> Lewis V, Larson B, McClurg A, Boswell R, Fisher E. The promise and peril of accountable care for vulnerable populations: a framework for overcoming obstacles. *Health Affairs* 2012;31(8):1777-85.
- <sup>153</sup> Roussos S, Fawcett S. A review of collaborative partnerships as a strategy for improving community health. *Annual Review of Public Health* 2000;21:369-402.
- <sup>154</sup> Varda D, Chandra A, Stern S, Lurie N. Core dimensions of connectivity in public health collaboratives. *J Public Health Management Practice* 2008;14(5):E1-E7.
- <sup>155</sup> Fawcett S, Schultz J, Watson-Thompson J, Fox M, Bremby R. Building multisectoral partnerships for population health and health equity. *Preventing Chronic Disease* 2010;7(6):A118.
- <sup>156</sup> Woulfe J, Oliver T, Zahner S, Siemering K. Multisector partnerships in population health improvement. *Preventing Chronic Disease* 2010;7(6):A119.
- <sup>157</sup> Hostetter M, Klein S. *Improving population health through communitywide partnerships*. Commonwealth fund. *Quality Matters*. <http://www.commonwealthfund.org/Newsletters/Quality-Matters/2012/February-March/In-Focus.aspx>. Accessed 10/07/12.
- <sup>158</sup> Gourevitch M, Cannell T, Boufford J, Summers C. The challenge of attribution: framing responsibility for population health in the context of accountable care. *American Journal of Public Health* 2012;102(Supplement 3):S322-S324.
- <sup>159</sup> House of Commons. Health Committee. *Health inequalities*. London: The Stationery Office Limited, 2009.
- <sup>160</sup> Whitehead M, Doran T, Exworthy M, Richards S, Matheson D. *Final report of Task Group 7: delivery systems and mechanisms for reducing inequalities in both social determinants and health outcomes*. <http://www.instituteofhealthequity.org/projects/delivery-systems-and-mechanisms-task-group-report/delivery-task-group-full-report.pdf>. Accessed 10/07/12.

- 
- <sup>161</sup> The Marmot Review. *Fair society, healthy lives*. <http://www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review/fair-society-healthy-lives-full-report>. Accessed 10/07/12.
- <sup>162</sup> Dixon A, Khachatryan A, Wallace A, Peckham S, Boyce T, Gillam S. *Impact of Quality and Outcomes Framework on health inequalities*. London, England: The Kings Fund, 2011.
- <sup>163</sup> Yi D. Medical insurer ties pay to members' health. *Los Angeles Times*, April 4, 2007. <http://www.latimes.com/business/la-fi-healthpay4apr04.1.4216256.story?coll=la-headlines-business>. Accessed 01/08/12.
- <sup>164</sup> WellPoint Inc. WellPoint's Member Health Index shows improvement in the quality of health care received. Press release, June 25, 2008. <http://ir.wellpoint.com/phoenix.zhtml?c=130104&p=irol-newsarticle&id=1169406&highlight>. Accessed 01/08/12.
- <sup>165</sup> Neufeld V, Maudsley R, Pickering R, Turnbull J, Weston W, Brown M, Simpson J. Educating future physicians for Ontario. *Academic Medicine* 1998;73(11):1133-48.
- <sup>166</sup> Frank J. *The CanMEDS 2005 physician competency framework*. Ottawa: Royal College of Physicians and Surgeons of Canada, 2005.
- <sup>167</sup> College of Family Physicians of Canada. *Four principles of family medicine*. <http://www.cfpc.ca/principles/>. Accessed 01/08/12.
- <sup>168</sup> Section of Teachers of Family Medicine, College of Family Physicians of Canada. *CanMEDS-Family Medicine. Working Group on Curriculum Review*. <http://cfpc.ca/uploadedFiles/Education/CanMeds%20FM%20Eng.pdf>. Accessed 10/07/12.
- <sup>169</sup> Lesser C, Lucey C, Egener B, Braddock C, Linas S, Levinson W. A behavioral and systems view of professionalism. *JAMA* 2010;304(24):2732-7.
- <sup>170</sup> Huth K, Raphael D. From awareness to advocacy: empowering healthcare professionals to address the social determinants of health. *McMaster University Medical Journal* 2011;8(1):71-3.
- <sup>171</sup> Stutsky B, Singer M, Renaud R. Determining the weighting and relative importance of CanMEDS roles and competencies. *BMC Research Notes* 2012;5:354. <http://www.biomedcentral.com/1756-0500/5/354>. Accessed 02/01/13.
- <sup>172</sup> Dharamsi S, Ho A, Spadafors S, Woollard R. The physician as health advocate: translating the quest for social responsibility into medical education and practice. *Academic Medicine* 2011;86(9):1108-13.
- <sup>173</sup> Liaison Committee on Medical Education. *Functions and structure of a medical school: standards for accreditation of medical education programs leading to the M.D. degree*. <http://www.lcme.org/functions.pdf>. Accessed 02/02/13.
- <sup>174</sup> College of Family Physicians of Canada. *A vision for Canada: family practice the patient's medical home*. [http://www.cfpc.ca/uploadedFiles/Resources/Resource\\_Items/PMH\\_A\\_Vision\\_for\\_Canada.pdf](http://www.cfpc.ca/uploadedFiles/Resources/Resource_Items/PMH_A_Vision_for_Canada.pdf). Accessed 02/02/13.
- <sup>175</sup> Medical Council of Canada. *Objectives for the Qualifying Examination*. [http://apps.mcc.ca/Objectives\\_Online/objectives.pl?lang=english&loc=contents#expert](http://apps.mcc.ca/Objectives_Online/objectives.pl?lang=english&loc=contents#expert). Accessed 05/19/13.
- <sup>176</sup> Public Health Task Group. Association of Faculties of Medicine of Canada. *Enhancing the health of the population: the role of Canadian faculties of medicine*. [http://www.afmc.ca/pdf/2006\\_april\\_afmc\\_public\\_health\\_vision\\_paper.pdf](http://www.afmc.ca/pdf/2006_april_afmc_public_health_vision_paper.pdf). Accessed 05/19/13.
- <sup>177</sup> Association of Faculties of Medicine of Canada. *Primer on population health*. <http://phprimer.afmc.ca>. Accessed 02/02/13.
- <sup>178</sup> Allan J, Barwick T, Cashman S, Cawley J, Day C, Douglass C et al. Clinical prevention and population health: curriculum framework for health professions. *Am J Prev Med* 2004;27(5):471-6.
- <sup>179</sup> Shortell S, Swartzberg J. The physician as public health professional in the 21<sup>st</sup> century. *JAMA* 2008;300(24):2916-8.
- <sup>180</sup> Australian Medical Association. *Social determinants of health and the prevention of health inequities*. [http://www.ama.com.au/system/files/node/2723/AMA\\_Position\\_Statement\\_on\\_the\\_Social\\_Determinants\\_of\\_Health\\_and\\_the\\_Prevention\\_of\\_Health\\_Inequities\\_-\\_2007.pdf](http://www.ama.com.au/system/files/node/2723/AMA_Position_Statement_on_the_Social_Determinants_of_Health_and_the_Prevention_of_Health_Inequities_-_2007.pdf). Accessed 01/08/12.
- <sup>181</sup> Canadian Medical Association. *Health equity and the social determinants of health: a role for the medical profession*. <http://policybase.cma.ca/dbtw-wpd/Policy/pdf/PD13-03.pdf>. Accessed 05/19/13.
- <sup>182</sup> Royal Australian College of General Practitioners. *Population health and public health*. <http://curriculum.racgp.org.au/media/12302/populationhealthandpublichealth.pdf>. Accessed 05/20/13.
- <sup>183</sup> Tsuchiya A, Dolan P. Do NHS clinicians and members of the public share the same views about reducing inequalities in health? *Soc Sci Med* 2007;64(12):2499-503.

- <sup>184</sup> Canadian Population Health Initiative. *Select highlights on public views of the determinants of health*. Ottawa: Canadian Institute for Health Information, 2005.
- <sup>185</sup> Canadian Medical Association. *9<sup>th</sup> annual national report card on health care*. August 2009. [http://www.cma.ca/multimedia/CMA/Content/Images/Inside\\_cma/Media\\_Release/2009/report\\_card/Report-Card\\_en.pdf](http://www.cma.ca/multimedia/CMA/Content/Images/Inside_cma/Media_Release/2009/report_card/Report-Card_en.pdf). Accessed 01/08/12.
- <sup>186</sup> Lavis J, Ross S, Stoddart G, Hohenadel J, McLeod C, Evans R. Do Canadian civil servants care about the health of populations? *American Journal of Public Health* 2003;93(4):658-63.
- <sup>187</sup> Gauld R, Bloomfield A, Kiro C, Lavis J, Ross S. Conceptions and uses of public health ideas by New Zealand government policymakers: report on a five-agency survey. *Public Health* 2006;120(4):283-9.
- <sup>188</sup> Adily A, Ward J. Enhancing evidence-based practice in population health: staff views, barriers and strategies for change. *Australian Health Review* 2005;29(4):469-77.
- <sup>189</sup> Adily A, Ward J. Evidence based practice in population health: a regional survey to inform workforce development and organizational change. *Journal of Epidemiology and Community Health* 2004;58:455-60.
- <sup>190</sup> Frankish C, Moulton G, Quantz D, Carson A, Casebeer A, Eyles J, Labonte R, Evoy B. Addressing the non-medical determinants of health. *Canadian Journal of Public Health* 2007;98(1):41-7.
- <sup>191</sup> Cohen B. Population health as a framework for public health practice: a Canadian perspective. *American Journal of Public Health* 2006;96(9):5-7.
- <sup>192</sup> Gibson T. *Policy implications on population health theory and practice among health workers*. [www.uregina.ca/cphr/pdfs/Gibson%20Policy%20Report%20-%20Feb%2027\\_06.pdf](http://www.uregina.ca/cphr/pdfs/Gibson%20Policy%20Report%20-%20Feb%2027_06.pdf). Accessed 01/08/12.
- <sup>193</sup> Eyles J, Brimacombe M, Chaulk P, Stoddart G, Pranger T, Moase O. What determines health? To where should we shift resources? Attitudes towards the determinants of health among multiple stakeholder groups in Prince Edward Island, Canada. *Social Science and Medicine* 2001;53:1611-19.
- <sup>194</sup> Eyles J, Stoddart G, Lavis J, Pranger T, Molyneaux-Smith L, McMullan C. *Making Resource Shifts Supportive of the broad determinants of health: the PEI experience*. [http://www.chsrf.ca/Migrated/PDF/ResearchReports/OGC/eyles\\_report.pdf](http://www.chsrf.ca/Migrated/PDF/ResearchReports/OGC/eyles_report.pdf) Accessed 01/08/12.
- <sup>195</sup> Stoddart, G, Eyles J, Lavis J, Chaulk P. Reallocating resources across public sectors to improve population health. Pp. 327-47 in Heyman J, Hertzman C, Barer M, Evans R. (eds.) *Healthier societies: from analysis to action*. New York: Oxford University Press, 2006.
- <sup>196</sup> Arah O, Westert G. Correlates of health and healthcare performance: applying the Canadian health indicators framework at the provincial-territorial level. *BMC Health Services Research* 2005;5:76 doi:10.1186/1472-6963-5-76.
- <sup>197</sup> Health Council of Canada. *Canadian survey of experiences with primary health care in 2007*. Toronto, 2008.
- <sup>198</sup> Starfield B, Shi L, Grover A, Macinko J. The effects of specialist supply on populations' health: assessing the evidence. *Health Affairs* 2005. DOI 10.1377/hlthaff.W5.97.
- <sup>199</sup> Statistics Canada. *CANSIM Table 105-0501. Indicators Has a regular medical doctor and Contact with a medical doctor in the past 12 months*. <http://www5.statcan.gc.ca/cansim/a01?lang=eng>. Accessed 01/09/12.
- <sup>200</sup> College of Family Physicians of Canada. *Report card November 2008*. <http://www2.cfpc.ca/local/files/Communications/Report%20Card%20FINAL%20English.pdf>. Accessed 01/09/12.
- <sup>201</sup> Yin R. *Applications of case study research*. 3<sup>rd</sup> edition. Los Angeles; Sage Publications Inc., 2012.
- <sup>202</sup> Canadian Institute for Health Information. *Pan-Canadian primary health care indicators. Report 1, volume 1*. Ottawa, 2006.
- <sup>203</sup> Canadian Institute for Health Information. *Enhancing the primary health care data collection infrastructure in Canada . Report 2*. Ottawa, 2006.
- <sup>204</sup> Alberta Health and Wellness, Alberta Medical Association, Regional Health Authorities. *Master agreement regarding the tri-lateral relationship and budget management process for strategic physician agreements. Schedule G primary care initiative agreement. April 1, 2003*. [http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/8FA96982F56BB835872570540058C6D6/\\$File/agreement\\_april1\\_2003.pdf](http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/8FA96982F56BB835872570540058C6D6/$File/agreement_april1_2003.pdf). Accessed 01/09/12.
- <sup>205</sup> Primary Care Initiative. *Legal model overview*. <http://www.albertapci.ca/Resources/guideandreference/Documents/25.LegalModelOverview.pdf>. Accessed 02/02/13.
- <sup>206</sup> Alberta Primary Care Initiative. *Guidelines for use of per-capita funding*. <http://www.albertapci.ca/DevelopingPCN/PCNFunding/Documents/GuidelinesforUseofPer-CapitaFundingv3.0May92008.pdf>. Accessed 01/09/12.

- <sup>207</sup> Every B. Better for ourselves and better for our patients: chronic disease management in Primary Care Networks. *Healthcare Quarterly* 2007;10(3):70-4.
- <sup>208</sup> Alberta Primary Care Initiative. *About PCNs*. <http://www.albertapci.ca/ABOUTPCNS/Pages/default.aspx>. Accessed 01/09/12.
- <sup>209</sup> Health Quality Council of Alberta. *Satisfaction with health care services: a survey of Albertans, 2006*. Edmonton, 2006.
- <sup>210</sup> Alberta Health Services. *Health promotion, disease and injury prevention action plan 2010 and beyond*. Edmonton, 2010.
- <sup>211</sup> Alberta Health Services. *Towards an understanding of health equity: glossary*. Edmonton 2011.
- <sup>212</sup> College of Family Physicians of Canada, Canadian Medical Association, Royal College of Physicians and Surgeons of Canada. *National Physician Survey 2011: national results by province and Canada. Q27. Thinking about your main patient care setting, which of these describes your record keeping system?* <http://www.nationalphysiciansurvey.ca/>.
- <sup>213</sup> Alberta Primary Care Initiative. *Access. Improvement. Measures*. <http://www.albertapci.ca/ABOUTPCN/RELATEDPROGRAMS/AIM/Pages/default.aspx>. Accessed 01/09/12.
- <sup>214</sup> Alberta Medical Association. *The President's letter* September 16, 2009. [http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/4C2E247349659BD58725763300532A11/\\$File/preslet\\_sept16\\_09.pdf](http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/4C2E247349659BD58725763300532A11/$File/preslet_sept16_09.pdf). Accessed 01/09/12.
- <sup>215</sup> Canadian Institute for Health Information. *Supply, distribution and migration of Canadian physicians, 2009*. Ottawa, 2010.
- <sup>216</sup> Alberta Primary Care Initiative. *Performance and Diligence Indicators Program. Phase II menu of performance indicators*. Undated photocopy.
- <sup>217</sup> Alberta Medical Association. *The President's letter* December 10, 2010. [http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/DEEA61314C4E866F872577F50071AECE/\\$File/Preslet\\_Dec10\\_10.pdf](http://www.albertadoctors.org/bcm/ama/ama-website.nsf/AllDoc/DEEA61314C4E866F872577F50071AECE/$File/Preslet_Dec10_10.pdf). Accessed 01/09/12
- <sup>218</sup> Alberta Primary Care Initiative. *PDI program staff: reflections and lessons learned*. Edmonton, 2010.
- <sup>219</sup> Canadian Institute for Health Information. *How healthy are rural Canadians? an assessment of their health status and health determinants*. Ottawa, 2006.
- <sup>220</sup> Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 2006;18(1):59-82.
- <sup>221</sup> Siström M. *Lost in translation: population health ideas in the American policy arena. Presentation to the Oregon Environmental Council first annual NW environmental health conference, Feb 6-7, 2009*. <http://www.oeconline.org/our-work/kidshealth/healthprofessionals/first-annual-nw-health-conference-pdfs/day-1/Siström%202.6.09.pdf>. Accessed 07/01/09.
- <sup>222</sup> Scott's Directories. *Canadian medical directory 57<sup>th</sup> edition*. Toronto, BIG Directories Partnership, 2011.
- <sup>223</sup> Kanter M, Martinez O, Lindsay G, Andrews K, Denver C. Proactive office encounter: a systematic approach to preventive and chronic care at every patient encounter. *Permante Journal* 2010;14(3):38-43.
- <sup>224</sup> Johnson J, Balko S, Hugel G. Chapter 1: Background and methods. In Johnson J, editor *Alberta Diabetes 2011*. Edmonton AB: Institute of Health Economics 2011:1-10.
- <sup>225</sup> Toward Optimized Practice. *Periodic Health Exam Checklist*. [http://www.topalbertadoctors.org/hsia/hsia\\_documents/phe\\_checklist.pdf](http://www.topalbertadoctors.org/hsia/hsia_documents/phe_checklist.pdf). Accessed 10/07/12.
- <sup>226</sup> Alberta Medical Association. *New Complex Care Plan: engages patients, remunerates for comprehensive care*. *Alberta Doctors' Digest* 2009;34(3):6-7.
- <sup>227</sup> Ekos Research Associates Inc. *Health & health care in 21<sup>st</sup> century*. Ottawa, 2012.
- <sup>228</sup> Canadian Medical Association. *12<sup>th</sup> annual national report card on health care. 2012*. [http://www.cma.ca/multimedia/CMA/Content/Images/Inside\\_cma/Media\\_Release/2012/reportcard/CMA-2012National-Report-Card\\_en.pdf](http://www.cma.ca/multimedia/CMA/Content/Images/Inside_cma/Media_Release/2012/reportcard/CMA-2012National-Report-Card_en.pdf). Accessed 05/20/13.
- <sup>229</sup> Gottlieb L, Sandel M, Adler N. Collecting and applying data on social determinants of health in health care settings. *JAMA INTERN MED* 2012;173(11):1017-20.
- <sup>230</sup> Hill J. Understanding the social factors that contribute to diabetes: a means of informing health care and social policies for the chronically ill. *The Permante Journal* 2013;17(2):67-72.
- <sup>231</sup> Canadian Institute for Health Information. *List of updated pan-Canadian primary health care indicators*. [http://www.cihi.ca/CIHI-ext-portal/pdf/internet/PHC\\_HANDOUT\\_EN](http://www.cihi.ca/CIHI-ext-portal/pdf/internet/PHC_HANDOUT_EN). Accessed 02/03/13.

- <sup>232</sup> Canadian Institute for Health Information. *Draft pan-Canadian primary health care electronic medical record content standard, version 2.1 – implementation guide*. [https://secure.cihi.ca/free\\_products/PHC\\_EMR\\_ContentStandards\\_E.pdf](https://secure.cihi.ca/free_products/PHC_EMR_ContentStandards_E.pdf). Accessed 08/26/13.
- <sup>233</sup> Coburn D, Denny K, Mykhalovskiy E, McDonough P, Robertson A, Love R. Population health in Canada: a brief critique. *American Journal of Public Health* 2003;93(3):392-6.
- <sup>234</sup> Macdonald J, Raphael D, Labonte R, Colman R, Torgerson R, Hayward K. Income and health in Canada: Canadians researchers' conceptualizations make policy change unlikely. *International Journal of Health Services* 2009;39(3):525-43.
- <sup>235</sup> Goldstein D, Holmes J. 2011 Physicians' daily life report. <http://www.rwjf.org/content/dam/web-assets/2011/11/2011-physicians--daily-life-report>. Accessed 08/26/13.
- <sup>236</sup> Brandling J, House W. Social prescribing in general practice: adding meaning to medicine. *British Journal of General Practice* 2009;59(563):454-6.
- <sup>237</sup> Canadian Medical Association. *Physicians and health equity: opportunities in practice*. <http://healthcaretransformation.ca/wp-content/uploads/2013/03/Health-Equity-Opportunities-in-Practice-Final-E.pdf>. Accessed 08/26/13.
- <sup>238</sup> McIntyre L, Shyleyko R, Nicholson C, Beanlands H, McLaren L. Perceptions of the social determinants of health by two groups more and less affiliated with public health in Canada. *BMC Research Notes* 2013;6:247 doi:10.1186/1756-0500-6-247. Accessed 08/26/13.
- <sup>239</sup> Allen M, Allen J, Hogarth S, Marmot M. *Working for equity: the role of health professionals*. <http://www.instituteofhealthequity.org/projects/working-for-health-equity-the-role-of-health-professionals/working-for-health-equity-full-report>. Accessed 08/26/13.
- <sup>240</sup> Wodchis W. *High cost users: driving value with a patient-centred health system*. [http://www.southwestlin.on.ca/uploadedFiles/Public\\_Community/Current\\_Initiatives/Health\\_Links/High%20Cost%20Users.pdf](http://www.southwestlin.on.ca/uploadedFiles/Public_Community/Current_Initiatives/Health_Links/High%20Cost%20Users.pdf). Accessed 02/03/13.
- <sup>241</sup> Bush H. Health care's costliest 1%. *Hospitals and Health Networks* 2012;86(9):30-4,36,1.
- <sup>242</sup> Ontario Ministry of Health and Long-Term Care. *About Health Links*. <http://news.ontario.ca/mohltc/en/2012/12/about-health-links.html>. Accessed 02/04/13.
- <sup>243</sup> Rosser W, McDowell I, Newell C. Use of reminders for preventive procedures in family medicine. *Can Med Assoc J* 1991;145(7):807-12,814.
- <sup>244</sup> MD Physician Services. *Mydoctor.ca health portal*. <https://www.mydoctor.ca/patient/welcome.do>. Accessed 02/04/13.
- <sup>245</sup> Alberta Toward Optimized Practice Program. *Screening maneuvers menu for adults*. *Alberta Screening & Prevention Initiative*. <http://www.topalbertadoctors.org/file/asap-maneuvers-menu.pdf>. Accessed 08/26/13.
- <sup>246</sup> Isham G, Zimmerman D, Kindig D, Hornseth G. HealthPartners adopts community business model to deepen focus on nonclinical factors of health outcomes. *Health Affairs* 2013;32(8):1446-52.
- <sup>247</sup> HealthPartners. *Quick facts*. <http://www.healthpartners.com/public/about/quick-facts>. Accessed 08/26/13.
- <sup>248</sup> Alberta Health Services. *A discussion paper on primary care models*. February, 2010. Edmonton, 2010.
- <sup>249</sup> Alberta Health Services. *Alberta Health Services: Strategic Clinical Networks a primer & working document (August 7, 2012-V5)*. <http://www.albertahealthservices.ca/Strategic%20Clinical%20Networks/ahs-scn-primer.pdf>. Accessed 05/13/13.
- <sup>250</sup> Alberta Health Services. *Strategic Clinical Networks*. <http://www.albertahealthservices.ca/scn.asp>. Accessed 05/13/13.
- <sup>251</sup> Perna G. Population health management in real time. *Healthcare Informatics* 2012;29(2):26,28.
- <sup>252</sup> Health Council of Canada. *How do Canadian primary care physicians rate the health system?* [http://www.healthcouncilcanada.ca/tree/HCC\\_Bulletin7\\_ENG\\_WEB.pdf](http://www.healthcouncilcanada.ca/tree/HCC_Bulletin7_ENG_WEB.pdf). Accessed 02/03/13.
- <sup>253</sup> Alberta Health and Wellness. *Family care clinics*. <http://www.health.alberta.ca/services/family-care-clinics.html>. Accessed 02/03/13.
- <sup>254</sup> Horne F. Minister's message. *Minister's Advisory Committee on Primary Health Care Bulletin 3 – December, 2012*. <http://www.health.alberta.ca/documents/PHC-MAC-Bulletin3-2012Dec.pdf>. Accessed 02/03/13.
- <sup>255</sup> Alberta Health and Wellness. *Primary health care transformation. Family Care Clinic reference manual. Wave 2*. <http://www.health.alberta.ca/documents/PHC-FCC-Reference-Manual.pdf>. Accessed 08/26/13.
- <sup>256</sup> Alberta Health, Alberta Medical Association. *Tentative AMA agreement 2011-2018 package*. [https://www.albertadoctors.org/Media%20-%20Imposition/Media\\_Negotiations\\_AMA%20AgreementandThreeConsultationAgreements.pdf](https://www.albertadoctors.org/Media%20-%20Imposition/Media_Negotiations_AMA%20AgreementandThreeConsultationAgreements.pdf). Accessed 05/13/13.

- 
- <sup>257</sup> Thorlby R. *Reclaiming a population health perspective: future challenges for primary care*. [http://www.nuffieldtrust.org.uk/sites/files/nuffield/publication/130425\\_reclaiming-a-population-health-perspective.pdf](http://www.nuffieldtrust.org.uk/sites/files/nuffield/publication/130425_reclaiming-a-population-health-perspective.pdf). Accessed 08/29/13.
- <sup>258</sup> Kiran T, Maxted J, Naimer M, Adcock L, Tirkos S, Rey M, Daien D, Ellison P. *Measurement for improvement: report of the Working Group on Measurement for Improvement, Quality Program Committee*. <http://dfcm2.cmsstaging.utoronto.ca/AssetFactory.aspx?did=2910>. Accessed 08/30/13
- <sup>259</sup> Ontario Ministry of Health and Long-Term Care. *Ontario's action plan for health care*. [http://www.health.gov.on.ca/en/ms/ecfa/healthy\\_change/docs/rep\\_healthychange.pdf](http://www.health.gov.on.ca/en/ms/ecfa/healthy_change/docs/rep_healthychange.pdf). Accessed 02/04/13.
- <sup>260</sup> Premier's Advisory Council on Health. *A framework for reform: report of the Premier's Advisory Council on Health*. <http://www.health.alberta.ca/documents/Mazankowski-Report-2001.pdf>. Accessed 02/04/13.
- <sup>261</sup> British Columbia Medical Association. *Regionalizing health care budgets in BC*. [https://www.bcma.org/files/Regionalizing\\_Health\\_Care\\_Budgets\\_in\\_BC.pdf](https://www.bcma.org/files/Regionalizing_Health_Care_Budgets_in_BC.pdf). Accessed 02/04/13.
- <sup>262</sup> Rogers E. *Diffusion of innovations*. New York:Free Press, 1962.
- <sup>263</sup> Reay T, Goodrick E, Casebeer A, Hinings C. Legitimizing new practices in primary health care. *Health Care Management Review* 2012;38(1):9-19.
- <sup>264</sup> Mahamoud A, Roche B, Homer J. Modelling the social determinants of health and simulating short-term and long-term intervention impacts for the city of Toronto, Canada. *Social science & Medicine* 2013;93:247-55. Doi: 10.1016/j.socscimed.2012.06.036. Accessed 08/27/13.
- <sup>265</sup> Scott A, Sivey P, Ouakrim D, Willenberg L, Naccarella L, Young D. *The effect of financial incentives on the quality of health care provided by primary care physicians*. <http://summaries.cochrane.org/CD008451/the-effect-of-financial-incentives-on-the-quality-of-health-care-provided-by-primary-care-physicians>. Accessed 02/04/13.
- <sup>266</sup> Ontario. *Excellent Care for All Act, 2010. S.O. 2010, Chapter 14*. [http://www.e-laws.gov.on.ca/html/statutes/english/elaws\\_statutes\\_10e14\\_e.htm](http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_10e14_e.htm). Accessed 11/21/12.